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MAN alone has superposed an artificial life on his natural life and thereby has found means to pass from a material existence for which alone evolution appears to have provided, into a realm of beauty, truth and goodness, a world in which whatever be the eternal values, he has at least found means to hold communion with those who have lived and with those who will live. What has brought him this enfranchisement? All that evolution has done has been to set him free and trust him with freedom and thus place in man's hands his own fate, the future of humanity.

The idea of freedom originated in the Christian conception of man's relation to God and the problem it raises first became explicit in Christian Doctrine. That problem was involved in the philosophical interpretation of history which Paul made the ground of the Christian revelation. The aim of this latest work of Professor Carr is to show how that problem was taken over by philosophy at the Reformation and has now become transformed from a problem of the relation of the individual soul to God into the more general and yet profounder problem of the relation of mind to nature.

THE UNIQUE STATUS OF MAN

BY

H. WILDON CARR

CHANGING BACKGROUNDS IN RELIGION AND ETHICS

THE SCIENTIFIC APPROACH TO PHILOSOPHY

A THEORY OF MONADS

THE PRINCIPLE OF RELATIVITY

THE PHILOSOPHY OF BENEDETTO CROCE

THE PHILOSOPHY OF CHANGE

Translations

MIND-ENERGY BY HENRI BERGSON

THE THEORY OF MIND AS PURE ACT BY GIOVANNI GENTILE

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THE UNIQUE STATUS OF MAN

BY

HERBERT WILDON CARR

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The New Era Foundation of the University of Southern California

This Lectureship was established by the University in 1918 through the President, G. F. Bovard, and the Board of Trustees, and placed under the auspices of the School of Religion.

The Foundation was created for the purpose of emphasizing the contribution of education to the attainment of Christian character.

The Lectureship is biennial. The lecturers on the Foundation are:

1919, Bishop Adna W. Leonard
1921, Bishop Richard J. Cooke
1923, Bishop Francis J. McConnell
1925, Bishop Edwin H. Hughes
1927, Doctor Herbert Wildon Carr

PREFACE

The School of Religion of the University of Southern California in honoring me with the invitation to deliver this course of lectures on the New Era Foundation accompanied it with the following instruction:

> It is desired that the subject be one related to the development of Christian truth, a consideration of some timely and vital phase of the subject, which will aim to be a contribution to the religious thinking of the day, especially from the Christian standpoint.

In accepting the invitation I felt that I could follow the instruction in the spirit and in the letter. I am not associated officially or unofficially with any of the Christian denominations. I am a teacher of philosophy. Yet as a philosopher I realize that I could not if I would and would not if I could dissociate myself from Christianity as the vitalizing movement which alike in substance and in form has determined the direction of modern philosophy. It is generally recognized that our whole Western civilization from the decline and fall of the Roman Empire has been the historical develop-

ment of the Christian ideal, and there is a sense in which every thinker of the modern period is Christian, a meaning of the term Christian which would include even such philosophers as Hobbes the materialist, Voltaire the deist, and Spinoza the Jew. There is however a profounder sense in which all modern philosophy is Christian, without necessarily being Christian philosophy, for by Christianity may be meant not merely a certain cycle of events to which more than one historical interpretation can be given but an entirely new idea of the interpretation of history itself. In this profounder meaning the interest of Christianity is not the historical criticism of its records but the philosophical interpretation of the idea expressed in its history.

I have chosen as an illustration of this philosophical interest the problem of freewill, because it is essentially the problem of Christianity. The idea of freedom originated in the Christian conception of man's relation to God and the problem of freewill first became explicit in the development of Christian doctrine. I have endeavored to show how the freewill problem was involved in the philosophical interpretation of history which the Apostle Paul made the ground of the Christian revelation, how it was taken over by philosophy at the Reformation, and how in modern thought it has been transformed from a problem of the relation of the individual soul to God to the

more general and yet profounder problem of the relation of mind to nature.

The lectures were delivered in the University of Southern California in the Spring Semester 1927 under the general title, "The Freewill Problem in the Light of Modern Scientific Developments." The aim of the lectures was to trace the emergence in modern philosophy of the positive idea of freedom which gives man his unique status.

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I

THE THEOLOGICAL FORM OF THE FREEWILL PROBLEM

It is a significant fact that historically Christianity arose in an emancipation of the restless rationalizing spirit of man from the bondage of an authoritative national institution. The apostles of Christianity did not proclaim a new religion or even a new revelation, but a new enlightenment and a consequent new freedom. The missionaries of the gospel did not denounce a false Baal in order to set up in his place a true Jehovah. They did not act like the Sultan Mahomet II when in his triumphant entry as conqueror into Constantinople he cleansed the Metropolitan Church of St. Sophia, clearing away its altars and icons and converting it straightway into a Mosque of Allah. They did not attempt to imitate Jesus himself in the cleansing of the temple when he overthrew the tables of the money-changers. And even in their triumph they did not convert the pagans in the manner of the zealous followers of the chivalrous and adventurous Cortez in Mexico and change a heathen

into a Christian people by enshrining the Virgin in the great Aztec temple and substituting the sacrifice of the mass for the bloody rites of the old religion. Very different in origin and in intention was the gospel of the new dispensation of Christianity, and very different the attitude of its founders toward the old. "God who at sundry times and in divers manners spake in time past unto the fathers by the prophets, hath in these last days spoken unto us by his Son."

The new gospel was a rationalizing, a spiritualizing or, as we should say today, a modernizing of religious beliefs. Paul of Tarsus, the chief builder of the new spiritual edifice, was a devout Jew, a Pharisee of the Pharisees. He was no sceptic, no iconoclast, no fanatic. The church has ranked him among its saints. The world should rank him among its philosophers. He is not a poet; his thought finds no expression in artistic imagery. His appeal is to reason; his method and his teaching are intellectual. God, he argues, has revealed himself to our fathers and is revealing himself to us, but all revelation implies a response, an active reception, an understanding which is not merely passive but calls for a spiritual effort, a free. act. We may in fact sum up the achievement of the great apostle as the triumphant affirmation of spiritual freedom. The constant exhortation to which every argument leads is to cast off the bondage of the law and enter into the freedom of the spirit.

"Stand fast in the liberty wherewith Christ hath made us free, and be not entangled again with the yoke of bondage."

It is this new conception of the freedom of the human spirit introduced by the apostle Paul into the new religion as its vitalizing principle which historically is the origin of the freewill problem and the determining cause of the form it has assumed in modern philosophy. This is so fundamentally important to an understanding of the problem that the first thing necessary is to realize the significance of the Pauline teaching.

The two characteristic doctrines of the apostle Paul are the atonement and justification by faith—not the incarnation, nor the virgin birth, of which there is no evidence that he had ever heard, nor even the resurrection, although his firm assurance of that fact is always in the forefront of his teaching. Belief in the resurrection of the body accorded completely with Paul's religion before his conversion. He was a Pharisee. The fact of the resurrection of Jesus therefore presented no intellectual difficulty to him whatever, and the evidence of it, in his own personal case, rested quite naturally on the direct communication he was assured that he had had with the risen Christ, at his conversion. The doctrines of the atonement and of justification by faith are in an entirely different category. The doctrine of the atonement appears to have burst in upon his mind as a sudden illumination which

interpreted for him in a new and marvelous way the whole scriptural record and the Messianic expectation of the Hebrew people to which it was his pride to belong. What it gave him was the key to a rational interpretation of history. It raised him immediately to a new place in the intellectual hierarchy. He becomes the first philosopher of history. History is, for Paul, God revealing himself. In the light of his new idea a high spiritual significance is seen irradiating plain matter of fact. The crucified Christ is the fulfillment of the law. But, and here is the significant fact, it is "in the fullness of time" that the revelation comes. A sublime divine scheme of redemption is seen to have been symbolized, shadowed forth darkly in ceremonial ordinances and institutions, and, more wonderful still, in the lives of historical personages. Jesus is the second Adam finally restoring the lost paradise. Hagar, the bond-woman, is the old dispensation. Ishmael, the son of the bondslave, shall not inherit with Isaac the son of the free woman. Not here and there but throughout the whole story of the human race is the divine revelation now unfolded and in these last days made clearly manifest. And then the amazing boldness of the finale! This just man, renounced by his own people, crucified by the Gentile, is revealed not as Messiah, the hope and expectation of Israel, but as the Son of God, his death the atoning sacrifice shadowed forth in the ceremonial law.

Consider now the other side, the subjective side, of the Pauline gospel, the doctrine of justification by faith. In it we have the triumphant affirmation of human freedom, the self-assertion of the spirit. The exhortation to believe, to enter by faith into possession of the new life, was not in Paul's case the call to subdue questionings, to silence doubt, to accept authority, to bow before tradition, to obey the letter of the commandment, to accept with childlike, reverent submission the truth once delivered to the saints. Whatever the exhortation to faith may mean today in the mouth of the Christian preacher, to Paul it meant the rejection of authority, the breaking with tradition, emancipation, bursting the chains of bondage. The faith which the apostle preached was not opposed to reason, it was the exercise of reason, the grasp or apprehension of truth by an intellectual effort. What Paul appealed to, when he defended himself against the authorities of his nation, was history. He besought them to read in the present situation, by the light of reason, the interpretation of the past. Those who exhort us today to cling to the faith of our fathers, who oppose the critical and questioning spirit, who denounce science, may find their justification in the attainment or possession of personal sanctity and in the enjoyment of religious peace, but they cannot claim to be followers of the great apostle. Paul was a rationalizer and a modernist.

If we regard Christianity as a philosophy of

life, in place of the ordinary external view of it as an institution guarding a set of fixed dogmas, then when we survey the history of the nineteen centuries which have passed since its birth we see that every manifestation of its life, every strong stirring within its consciousness, every expression of its living spirit, has been a revival of the Pauline doctrine and a reassertion of the Pauline claim for the freedom of the rational human individual, for a faith which implies the free exercise of reason.

The most cursory glance over Christian history is sufficient to show the essential truth of this judgment. The personal religion of St. Augustine was a revival of the Pauline teaching. The Lutheran reformation arose in the preaching of a monk who appeared to have rediscovered the Epistle to the Galatians and to have become its author reincarnated. The Jansenist doctrine which gave expression to the deep spiritual forces underlying the Catholic reaction was the Pauline principle and doctrine reaffirmed.

It is this original idea of Paul of Tarsus, its embodiment in the creed of the Christian church, its vitalizing influence in all the intellectual crises of that church, which has given to Western philosophy the freewill problem and determined the form in which that problem has always been posited. Let us look then a little closely at the Pauline conception itself.

We may claim in the first place for the apostle Paul that it is his philosophical con-

ception of God and man which gives to Christianity its distinguishing character as religion, and which places it in a category by itself when compared with all other religious systems. There are two principles which Paul takes for granted probably because his birth and upbringing had made them appear unchallengeable These are (1) that the revelation of God to man is historical and that historical revelation is continuous and progressive; and (2) that to understand and profit by this revelation man must exercise the rational nature which is his prerogative. Neither of these principles was the result of a discovery. Both followed naturally from the fact that the Hebrew religion was based on a historical record, that it consisted of the law and the prophets, that it affirmed such historical facts as that Jehovah made a covenant with Abraham, spoke face to face with Moses, wrote the tables of the law, chose David to supplant Saul, inspired the prophet Isaiah, and so forth. All this Hebrew sacred literature would present to an intellectual, scholarly Jew of Paul's day much the same aspect as it presents to the modern critic. It would seem to embody sound philosophical teaching and fundamental religious truth in sacred legend, legend to be believed or disbelieved, valuable chiefly on account of the authority and dignity which it conferred on what was the really important matter, the commandment or ordinance itself. Paul brings to his intellectual inheritance a

new idea, significant and fruitful beyond anything which the apostle himself could have foreseen, and this idea, introduced into the new gospel of Christ, becomes the philosophical basis of the Christian religion. The Hebrew tradition supposed that revelation is historical; Paul interprets this to mean that history is revelation. The Hebrews believed that Jehovah had intervened on occasions at critical points in their history; Paul teaches that the divine purpose is the whole meaning of their history and that the unfolding of that purpose is continuous in their history. It is true that, if we are to judge Paul by his view of the historical past and by his reading of the signs of his own time, we shall have to admit that his view was narrow in its scope, strangely foreshortened in its outlook and completely wrong in its definite pronouncement. As he interpreted Jesus and the atonement, the crucifixion marked the consummation of the divine purpose. There is clear evidence that he believed the new dispensation was about to be inaugurated with a spectacular appearance of a glorified Messiah. The end of the world was at hand and Paul's secular and economic conduct and advice were clearly based on this view. When however we look at the essence of the Pauline idea and appreciate the boldness of his spirit in his interpretation of the sacred history by the freedom of his allegorizing and rationalizing, we see that he is bringing to birth an entirely new concept, one which is to raise the Christ idea

to a philosophical level reached by no other religion. The Olympic, the Delphic, the Eleusinian religions are animistic nature myths; Christianity stands out as the interpretation of the historical drama of humanity.

The act of faith, which according to the Pauline doctrine marked the inclusion of the believer in the new church and stamped him with the spiritual seal as a member of the family of God's elect, raised in a reflective and philosophical generation a problem of the most fundamental nature. It presented to the reflecting mind a dilemma from which even today no general agreement can be said to have been arrived at as to how to avoid it or how to escape it when it confronts us. Yet there is no evidence that Paul himself was conscious of it, and it is certain that if he was it was in an entirely different form from that which is assumed in later controversy. The reason is clear. Paul's cultural and intellectual environment secured him against the possibility of questioning that as historical fact God had chosen the Hebrew race, the race to which he belonged, to be the special depository of the revelation of God himself. Paul's nation, the Jewish people, was a chosen people, selected and privileged and set apart from all other nations as inheritors of the promises. What Paul with his keen intellectualizing, rationalizing mind sought to penetrate was the underlying spiritual meaning of this historical fact. God, he held, had chosen a particular nation to be the peculiar instrument

of his purpose, but also God had always required from the chosen individuals to whom he communicated the revelation of his purpose an active response in their faith. Here then to Paul was not a problem but the solution of a problem. The real sign of the true Israelite was not the outward mark of the covenant in the ceremonial custom of circumcision, it was the act of faith, a purely spiritual sign, a law written in the heart and not merely uttered by the lip. In his missionary zeal Paul was oblivious to any subtle metaphysical difficulty in the concept of this spiritual act. A wider problem confronted him. The election of the Hebrew race to be a peculiar people could have no narrow national purpose; it must be part of a universal scheme. The spiritual relationship in which man stands to God appears in a new light. The real elect, the peculiar people, the true sons of God, are those who are united by the spiritual tie of faith, and not by the mere outward racial mark. It was the fierce opposition and bitter controversy and fanatical hatred that this doctrine evoked which made it impossible that the problem implicit in the concept of the act of faith should trouble the apostle himself. The victory which Paul won for Christianity was the inclusion of this personal spiritual principle, justification by faith, in the creed and practice of the Christian church. Paul's influence was soon overshadowed by the institutional and sacramental framework in which the new religion, including

Paul's own doctrine of the atonement, was embodied. Had Christianity been purely Pauline it would have approximated much more than it does today to the ideal of the free churches, and much less to the catholic ideal. There is little doubt that Paul contemplated a purely spiritual community, united in expectation, confident that the time was short and the end of the world at hand.

It is the Pauline conception of the act of faith as the symbol and evidence of the divine calling, the direct sign to the individual of inclusion in and membership of the spiritual company of God's elect, which gave rise to the freewill problem and determined the form in which it first appeared in Western philosophy. The problem is essentially a problem of philosophy, notwithstanding the theological controversy which occasioned it. Theologians might wrangle concerning the correct exegesis of Scripture texts, but their fundamental difficulty was intellectual.

I will take as an illustration and instance of the freewill problem in its fully developed form the famous Jansenist controversy of the seventeenth century. It is a convenient instance because it centers round the indictment of the great Dr. Arnauld at the Sorbonne and the outside defense of his position by his friend Pascal, the mathematical genius, in the *Provincial Letters*. I will first briefly tell the story.

In the brilliant intellectual society of the

seventeenth century in France—the age of Richelieu, of the Medicean Princess Anne of Austria, of the Italian Cardinal Mazarin, and later of Louis XIV—two families occupy an extraordinary position, the Arnaulds and the Pascals. Their history is practically the history of the conventual institution of Port-Royal. Both families are distinguished by the piety, devotion and personal religion of all their members, by their fervid zeal in support of the Jansenist faction, by their faithful adhesion to the authority of the Catholic church, and their almost instinctive abhorrence of the principles of freedom advocated and practiced by the reformers. Yet it was the tragedy of their lives to find that their personal religion and their ideals of dedication and sanctification brought them into violent and distressing conflict with the church whose authority over them they acknowledged to be supreme. Of these two families two names stand out as preëminent. Antoine Arnauld, born in 1612, was the youngest of a large family and died in exile at the age of eighty-two. Blaise Pascal, born in 1623, a delicate child, specially educated by his father and revealing in his childhood the signs of his mathematical genius, died in 1662 at the age of thirty-nine, the last ten years of his life having been passed in continual illness hardly ever free from actual pain. Arnauld entered the University of Paris and duly obtained his doctorate at the Sorbonne. Pascal never left

his home. His mother died in his infancy. The family, which consisted of the father, the son Blaise, and two sisters, Gilberte older than Blaise and Jacqueline younger, lived at Clermont-Ferrand in Auvergne, later at Rouen, and when the son was about nineteen, at Paris. These two men, Arnauld and Pascal, became the protagonists of the Jansenists in their controversy with the Molinists, a long and bitter conflict waged from beginning to end within the Catholic church, the struggle being not for the expulsion but for the submission of one of the opposing factions. The inwardness of the conflict is clear enough to us. The defenders of Jansen's great treatise, *Augustinus* (Jansen himself had died two years before the work was published), stood for the Pauline principle of the spiritual act of faith as the true mark of election and the true sign of the possession of saving grace, the doctrine of justification by faith. Their opponents upheld the sacramental principle, deprecating the individual act of judgment and the individual criterion of spiritual experience.

Antoine Arnauld had brilliant oratorical gifts and a consummate skill in dialectical encounters, and therewith not unnaturally the fatal power of making enemies. His doctorate thesis, defended with great éclat before the Sorbonne, entitled *De la Fréquente Communion,* aroused against him the bitter hostility of the Jesuits. It was directed against an authoritative book of their order in which

with characteristic casuistry it had been argued that, the more worldly and self-indulgent a believer was, the more lacking in the inward sign of grace, the more requisite was it that he should present himself often to communicate, the more boldly should he approach Jesus Christ in the eucharist. Arnauld examined the argument point by point, demonstrated that on the authority of the Fathers and of tradition an inward conversion was necessary if the outward sign of the sacrament was to be effective; that the condition of admission to communion was the true repentance of the sinner; that the condition of confession was true heart sorrow and love of God; and that the obtaining of absolution after contrite repentance, practiced and fulfilled, was requisite before communion. The book when published made a deep impression. It was widely read; the first edition was immediately exhausted and many editions followed. Nothing testifies more strikingly to the amount of deep personal religion which lived beneath the forms of worship about which dissentient sects were warring. This was in 1643; the clash did not come till twelve years later. The occasion was Arnauld's *Open Letter to a Duke and Peer,* in which he called in question whether the "five propositions" on which the Jesuit fathers had obtained the condemnation of Jansen's *Augustinus* were as a matter of fact to be found in that book. Arnauld was indicted before the Sorbonne for "temerity" in opposing his own judgment to that of the

papal court, and the famous battle was joined. Arnauld defended himself with his accustomed spirit and brilliance, but the result was a foregone conclusion. His enemies had the majority of votes. Arnauld was condemned, deprived of his doctorate and position, and though he escaped imprisonment by eluding his prosecutors he was compelled to spend most of his long life in hiding. There had intervened, however, during the trial, from an unknown quarter and quite unexpectedly, an influence which completely disconcerted the accusers of Arnauld and robbed the condemnation of all its value. While the oratorical display was in progress there appeared the *Letter written to a Provincial by One of His Friends on the Subject of the Present Disputes at the Sorbonne.* It was published under the pseudonym Louis de Montalte, and the most diligent inquiry failed to discover the real author. This was Blaise Pascal, at this time in religious retirement, a solitaire, dwelling in a cell at the Abbey of Port-Royal des Champs near Paris. With a wit and satire which only Molière has rivaled he described the great debate. Other letters followed in rapid succession and were eagerly read. There were eighteen in all and they grew in seriousness of purpose. The casuistry of the Jesuits was held up to scorn and reprobation; but, what was far more important, the two conflicting ideals of the Christian life, the two opposite concepts of the interpretation of the act of

faith, were brought into strong relief. The freewill problem is presented in a form which brings out vividly the antithesis of different interpretations. Moreover it is especially valuable in this connection inasmuch as both parties are on common ground: they are within the Catholic church and therefore the problem is not confused with any dispute as to the rival authority of Scripture and tradition, such as the disputes which had led to the secession of the reformers.

The full significance of this controversy will only be understood if I tell the pathetic story of the closing years of this most remarkable genius, who while still young sacrificed a brilliant worldly career in order that he might practice with severe austerity his philosophy of the Christian life.

Little more than a year before the *Provincial Letters* were written Pascal had undergone an experience which he described and referred to as his second conversion. In a state of spiritual exaltation he came to the decision, registering it there and then in writing, to make his total and complete renunciation of the world, his entire submission to Jesus Christ and his dedication to the religious life. When he formed this resolution he was not a disappointed or a disillusioned man. He was thirty-one, well-to-do, moving in the higher circles of society. The court and the diplomatic and administrative salons were open to him, and he was by no means indifferent to the allurements of finan-

cial undertakings involving risk. (He was the initiator of the first omnibus service in Paris, for which he procured a royal license, and he carried through the scheme successfully in the teeth of organized opposition.) Moreover he was recognized as an intellectual leader. He had done original work in pure mathematics and in applied mathematics. He was the inventor and designer of the first calculating machine. Also in physics he had contrived the crucial experiment on the Puy de Dôme which confirmed his theory of the weight of the atmosphere. This was the man who turned away from the allurements of his world, sacrificed the advantages of his position and his reputation in order to embrace a life of self-imposed privation and practical discomfort at the call of religion, not a call from without but a call from within. He entered the Jansenist institution, the famous convent of Port-Royal of which Arnauld's sister was the abbess and which was identified with Arnauld's faction. Port-Royal had within its confines a large enclosure converted into an artificial wilderness or desert to which those who desired a hermit's retreat could inhabit a cell and devote themselves to religious exercises. Pascal became a solitaire of Port-Royal. Hardly had he become settled in his new mode of life when the storm broke which threatened Port-Royal with ruin. This was the indictment of Arnauld before the Sorbonne, and from his seclusion he sent out the *Provincial Letters.* Chivalrous

and useful as his intervention was it could hardly have succeeded in suspending for an hour the threatening ruin but for an event of an entirely different nature which occurred at the convent when the crisis was at its height. This was the Miracle of the Holy Thorn. Pascal's niece, Marguerite Périer, a pensionaire at the school of Port-Royal, suffering from an abscess in the lacrymal gland which had baffled the skill of the doctors, was suddenly and miraculously cured by touching the relic of the crown of thorns exposed for adoration on the altar. The miracle was duly investigated and fully attested, and Port-Royal was saved. How did this affect Pascal? Almost all his apologists have taken the view that he acquiesced in the use made of this miracle and enjoyed the advantage of its acceptance in the sparing of the convent, at the same time that he was altogether too rational and too free from vulgar superstition to be influenced by it, let alone to accredit it. In my view the apologists and critics are wrong. Pascal did accept the miracle and it was a determining influence in his life and thought. It came in his case directly to verify the philosophy of miracles which he had already formulated in his own mind. The evidence for this is in the *Pensées.* It was not the only occasion in his life when he conceived himself to be the recipient of a direct mark of approval by God, but this was the most signal. Like the demon who, as Socrates believed, intervened only to inhibit

him from pursuing some course of action and never to indicate the course to pursue, so a miracle, Pascal believed, was an intervention by God, not directly to instruct or protect his servant, but to fortify his faith by a sign of approval. With it a flood of light seemed to illuminate his mind on the nature of miracle and its purpose. It was the foundation of a philosophy of revelation. It concentrated his attention on the problem which touched him most deeply, the apparent absence of Providence. Why does God hide his face? Why is God so indifferent to the triumph of truth? It was a far more torturing problem than why the wicked prosper, for here the struggle was within the divinely established church itself. Pascal was elated, not at the discomfort of the adversary, but at the token of approval. He formed then the plan of what in the *Pensées* is referred to as the *Apologie*. The design was to present Christianity as a philosophy. It was to contain a psychological and a theological part, and these two aspects of Christianity were to be fused into one and unified in the completest manner. It would show the purpose of miracle and the manner in which God at all times, as now, was employing it.

That work could never be completed. All that we have are wonderful fragments, the *Pensées*, perhaps the greatest treasure of religious philosophy the modern world possesses.

We have therefore in the life and work of Pascal the freewill problem in its theological

form presented as a personal tragedy. The deep spirituality of the doctrine of the grace of God, with all its psychological meaning in human experience, having to struggle for recognition against an external theological authority appealing to the written word and to tradition—it was a death struggle within the church between the spirit and the letter. I suppose today the Christian conscience would unhesitatingly decide for the Jansenists against the Jesuits, but not I think on the ground of the divine approval signified in the miracle which so deeply affected the great Pascal.

So much for the story. Let us now consider the two concepts of the nature of freewill which were the subject of the great dispute. In attempting to compare the rival doctrines of the Jansenists and the Jesuits with a view to discovering the real problem of freewill which underlay them, we must be careful to rid our minds of any prejudice against the Jesuit view on account of what we may consider the immorality of their casuistry. Each side could claim to be rational and logical and each side could appeal to authority.

We need not discuss the actual details of the five propositions around which the spiritual warfare was waged. We can go at once to the two concepts of the essential nature of a free act, which are the real subject of dispute.

According to the Christian doctrine of redemption, man's natural state, the consequence of original sin, could only be changed to a state

of grace by the mediation of Jesus Christ. This salvation of man had been won for him by the voluntary sacrifice of the incarnate Son of God, who had by his death on the cross made atonement for transgression. To obtain this salvation, to pass from the state of nature to the state of grace, an act of faith is the condition. What is the nature of this act of faith? There are two answers to this question, each of which can appeal to reason, to authority, to tradition, to Scripture, and the two answers are irreconcilable and mutually destructive. This constitutes the tragedy of the Christian theory as a rule of life. Let us as philosophers analyze each of the answers.

1. The first and most obvious answer is that the act of faith is the exercise by man of his freewill in making his choice between alternatives. Man, it is said, when confronted with alternative courses, is free to accept or reject either, and this implies that in the actual exercise of his choice he can adopt an attitude of indifference. So it is that man when he fell from grace was free to fall, and now that the means of salvation is provided he is free to return to grace. The act of faith, the I believe, is no other than the exercise of the ordinary power which every man has by right of his rational nature to assent to a proposition which he understands, to select either of two alternatives offered to his choice. The act of faith, the faith which justifies, is therefore the outward sign of acceptance. The inward-

ness of it is no more than the sincerity of the act itself.

This is neither an irrational nor a shallow answer. It has commended itself from time to time alike to the defenders of the sacramental and institutional and sacerdotal views of the Christian theory and to those who have taken the most ultra-personalistic view, who have believed in the most simple and direct relation between God and the rational spirit of man. Let us then examine it closely, first in its theological and second in its philosophical implications.

To take the theological argument, it may be said that the whole Christian theory postulates the redemption of man by the sacrificial atonement as accomplished fact. The crucifixion effected this once for all—the original transgression is forgiven, its effects wiped out, the lost paradise regained. Outwardly indeed there is no evident restoration. The world is still under the domination of the evil one. This is because the new kingdom of heaven is spiritual. According to the Catholic theory this spiritual government is embodied in the visible church. The church possesses the sacraments, the means of grace, the priesthood with vicarious powers derived from Jesus Christ by direct apostolic succession. This church can dispense its privileges only to those who make submission of their will to it. To benefit by its protection and enjoy its consolations, the believer must yield to its discipline

and accept its authority. This he does by the act of faith, and by this act he is justified, faith of course implying that the outward word is accompanied by the spiritual intention. The faithful are the pure in heart. The act of faith is a freewill act, for man is created free.

Equally this view is conformable to the theory of the free churches. It has been held by the Arminians in their opposition to the Calvinists. It has been held by many who reject altogether the idea of a visible church, of a sacerdotal institution, of an apostolic succession, and generally of any authority but the inspired word of God in the Scriptures carrying its direct message to the individual soul. They interpret the injunction to preach the gospel to all nations with the exhortation that all who believe shall be saved and all who refuse to believe shall be condemned, to mean that the act of faith is within the power of every individual, that it is the simplest imaginable act of free-willing.

Before we submit this conception of the nature of the act of faith to philosophical criticism, let us look at the theological difficulties it entails. They are very formidable. First, if man is able at any time and by the exercise of his own innate power to change from a state of nature to a state of grace, if he can do this unaided, why was the atonement necessary? On what are we to rest the case for such a desperate remedy? Man in the state of nature, by the hypothesis, is not lost; he can at any

moment of himself turn to God and live. If we answer that the crucifixion was the vicarious sacrifice of the Son of God as the punishment incurred by man in his transgression, then the freewill condition attached to its benefit is clearly contrary to justice, for a punishment will have been exacted for sins which remain and will forever remain unabsolved. The theologian finds himself confronted with a terrible dilemma: either Christ has paid a ransom in excess of the requirements, he has died for many who yet are not saved, or the atonement was to appease an angry God, indignant at man's sin but indifferent to man's salvation, for this is within man's own power. A further dilemma confronts the theologian in regard to the freewill act itself. If the act which justifies is merely the exercise of free choice, merely the signifying of assent to one of two alternatives, then as such an act is momentary, the state of grace secured by it can only be momentary. There can be no assurance of perseverance. It must be as easy to fall from a state of grace to a state of nature as to rise from a state of nature to a state of grace. Hence the dilemma: the condition of salvation is an act of faith which justifies, yet the act of faith can give no assurance of salvation for nothing guarantees its continued renewal. To give point to this theological difficulty let us cite two of the five propositions extracted from the *Augustinus* of Jansen which secured the condemnation of that

book first by Pope Innocent X and then by Pope Alexander VII. The first is: "Some of God's commandments are impossible of fulfilment by the righteous, with the forces at their disposal at the moment, in spite of their will and their efforts, while the grace which makes their fulfilment possible is withheld from them." This was illustrated by the case of Peter in the denial, which Augustine has declared was a case in point in which God intended to show the condition of a righteous man from whom grace is withheld. The last of the condemned propositions is: "It is a semi-Pelagian error to say that Christ has died and shed his blood for all men." The argument of Jansen had been that the Molinists or freewill party were incurring the same condemnation which Augustine had pronounced against the similar heresy of the semi-Pelagians in his day. The Augustinian and Jansenist doctrine was that Christ had died and shed his blood for the elect and the act of faith was the outward mark of divine grace and the sign of election.

Let us now look at the philosophical difficulty of this concept of freewill. Philosophy has nothing to object to it as a definition of freedom in its first and obvious intention. Freewill does refer to the power which everyone feels he possesses of choosing freely between alternatives to action presented to him at any moment of his active life. Also in its primary meaning such freewill is a lib-

erty of indifference, not in the sense that any practical alternative need be or ever in fact is indifferent, but in the sense that in making choice the mind can take an attitude of aloofness to external inducements and that this is a condition of free choice. The criticism of such a concept of freedom is not that it is faulty but that it is abstract, and this means that it acquires meaning for thought only when all particular content is removed from the fact of the free choice and its bare form is left. If now we bring philosophical analysis to bear upon this abstract concept we shall find that the very concept engenders all the antinomies we have already noted in the application of it. Hegel has taught us this lesson. It is his great discovery and his permanent contribution to thought. Take this liberty of indifference and bring it as an object for reflection, we may imagine him to say, and it becomes in the very process of reflective thought the opposite of itself, its own negation. Freedom pure and indifferent is pure necessity. It has no anchor. It is by definition purposeless and over against it stands purpose, resolution, determination. Freedom becomes chance, anarchy, chaos, the very opposite and negation of what at first it seemed to affirm. Our first thought of freedom is action without external restraint; we find in the end that real freedom is action with internal restraint, self-determination.

2. We have now to consider another and different answer which was given by Christian

thinkers to the question, What is saving faith? or What is the act of faith which carries with it the justification of the believer? It is an act, they declared, which is not within the power of man to perform; the power comes from and depends only on God. They named it therefore grace. Its effect was not momentary. It changed man's natural state into a state of grace.

This answer came from those who could claim to have experienced in themselves the reality of the religious life. It was the answer of devout Catholics who had little interest in church politics and deep interest in Christian doctrine. The act of faith to them was not an exercise of choice or dependent on the mood of a moment. It was the sign of election, the date-mark of their consciousness of a new birth, the evidence of adoption into the company of the redeemed, into the family of the sons of God. The contrast was not between obedience and disobedience to an external command, but between a state of nature in which man is helpless to keep God's commandments or to love God, and a state of grace in which man is sustained and directed in all his activity by the indwelling spirit of God in which he is able to say "not I but God working in me."

It is easy to see that this conception of saving grace as constituting the inwardness of the act of faith rests on an interpretation of the Christian doctrine of redemption which, however reconcilable it may be with the oppo-

site freewill theory, is yet profounder and more rational. It not merely alters the perspective, it changes the whole meaning. In the freewill theory we had the conception of an infinitely merciful creator, God, intervening benevolently in the interest of his creature, providing man a way of escape from his almost incredible folly. In this profounder conception of the grace of God the whole of human history, the whole world-problem, becomes a divine comedy. Initial defeat is itself made instrumental to perfect victory. Death, evil, even sin, prove the path and the means to richer life and perfected holiness. The work of redemption is no longer the salvation of man, it is the revelation of the living God. In redeeming man God is expressing his own life. It is true that this conception was never worked out in Christianity to its full logical consequence; indeed it could not be, for the God of Christianity is conceived as apart from as well as within the world. What it does reveal is the deep, inward need which the thoughtful believer experienced for the rationalization of his religious belief, for a philosophical ground of his religion. Like the prototype of Christian philosophers, the apostle Paul, he saw that this could be obtained only by a transmutation of history. The fall of man, the covenant with Noah and with Abraham, the election of Israel, the stoning of the prophets, the steadfastness of the remnant up to the final tragedy, the rejection and betrayal of the Messiah, became suddenly

illuminated in the light of inner experience. What was felt was the divine working within the soul, working against obstruction. The sense of sin, repentance, striving after righteousness, were written large in history, in the record of God's dealing with the whole human race. This history was no longer a record of events, it was a philosophy of human nature.

There was however in this view of the spiritual nature of the act of faith, and the deep significance of the individual life which it implied, a very serious theological difficulty. It revealed itself in the almost universal trend toward a mystical conception of the relation of God to man, a mystical conception in which the individuality alike of God and man was lost. All forms of Christian doctrine rejected and resisted with horror a pantheistic conclusion. It was necessary therefore at all costs to preserve the idea of God as a personal independent being, infinite in holiness and in power, with nothing to lose and nothing to gain by creating free rationalizing individuals, by loving them and redeeming them from the effects of disobedience, save only the expression and manifestation of his glory. How could it be consistent to suppose that such a being would enjoin commandments impossible to perform? And yet what escape is there from such a position if the divine call to believe on the Lord Jesus Christ and be saved is not within the power of the individual to whom it is addressed, but wholly dependent on the

grace of the legislator? It is easy for us to see that there is no answer. It is the freewill problem, and in one form after another it has presented to the philosophical believer a cruel dilemma. It is true it has never been allowed to stand in the way of a practical working of the Christian ideal of life. The difficulty indeed is theoretical only, not practical, and like all theoretical difficulties it is met by a compromise. The gospel is preached, the unregenerate are exhorted to believe, and their act of faith is interpreted as the direct working of the grace of God.

We have now to consider the philosophical bearing of this theological concept of the act of faith, the concept which regards faith as the sign of the divine work of regeneration, effected solely by the power of divine grace without any real initiative in the individual. We have in fact to consider this doctrine of grace not in its religious aspect but in its purely philosophical aspect as a concept of freedom. It presents itself at first as the direct negative of freewill, as the negation of freedom. In the natural state man can act only according to his nature; in the state of grace the striving against nature is not the striving of the natural man but the irresistible spirit of God working his regeneration. We seem therefore to have pure determinism in place of liberty, abstract necessity in place of freedom. When however we take full account of the new concept in the richness of its content we find that we have

changed the concept of freedom from the barren abstraction of a liberty of indifference to a concrete reality of self-determination. The free man is not the lawless man, but the man who is a law to himself. The effective man is not the God-defiant man, but the inspired prophet working with God.

Such is the freewill problem in the theological form which it assumed in the seventeenth century, when philosophers were conscious of a new freedom and when as yet thought had not freed itself from the trammels of patristic and scholastic formalism.

II

THE METAPHYSICAL FORM OF THE FREEWILL PROBLEM

THE great dispute between the Jansenists and the Jesuits in the seventeenth century concerning the nature of freewill was confined to theology. It was a struggle for the recognition of a doctrine as orthodox, and outwardly it differed little from the general character of all doctrinal controversies. Each side appealed to the written word and to the authoritative interpretation, and each side could make out a reasonable case. The poignancy of the dispute however lay in the fact that in this case the struggle of the parties for the authoritative recognition of their doctrine invaded and was fought out within the world of personal religious experience. It carried spiritual conflict into the cloister and into the home.

At the very time when this tragedy of the religious life was working desolation the great emancipation of philosophy from theology was being effected. While priests and friars and reverend doctors of divinity were discussing sovereignty, election, predestination, sufficient grace and final perseverance, and

anathematizing one another, Descartes was writing his *Principles of Philosophy* and modern science was advancing surely and rapidly by the experimental method which Galileo had inaugurated.

Modern philosophy was a change of method, based upon a new and complete confidence in natural reason. The concepts of the old theology passed into philosophy in their old theological form, retaining the theological terminology, but the problems to which those concepts gave rise were now discussed in a totally different spirit. Descartes, Spinoza, Malebranche, Geulincx, Leibniz, even the materialist Hobbes and the mathematician and astronomer Newton, formulate their problems in the terms of the old theology—the relation of the infinite to the finite, of God to the world, of the soul to the body, of the will to the intellect. There is, of course, as yet no criticism of history, no really serious questioning of revelation, except so far as textual or philological difficulties might occur in the records, and it is long before the scientific evidence for the antiquity of man or the history of creation will come into conflict with the literary records. The possibility that the world might be older than the fifty-six hundred years which separated their age from the creation of the first man never suggested itself, and no one had any reason to suppose that the narratives of the early patriarchs in Genesis might be mythical. It is a curious fact, which we hardly yet suf-

ficiently appreciate, that the great Copernican revolution which opened to men's minds the conception of an indefinitely extended space carried with it no concomitant extension of the temporal horizon. Newton, who detected errors in the biblical chronology, lived in expectation of witnessing the end of the dispensation. The change which the Renaissance had inaugurated and which led to the development of modern philosophy was not a change from faith to incredulity, not religious scepticism in any form; it was only the appeal to reason wherever the truth in question concerned the natural or the mental world. The appeal is no longer to authority, either to Scripture with its claim to be revelation or to the church with its claim to be the custodian of truth. It is man's confidence in his own power. Concepts whether they are of the material or of the spiritual world must justify themselves by their consistency and mutual reconcilability. The watchword is no longer *Credo ut intelligam,* but *Dubito ut cognoscam.*

Let us then look at the freewill problem as it appeared to philosophers in an intellectual environment and under the cold light of reason. The philosophers will still talk about God, the infinite and the finite, the soul, action and passion, desire, understanding and will. The appeal will still be to human experience, but it will no longer trouble and disturb the intimate privacy of personal religion.

The seventeenth century is par excellence

the age of philosophy. It precedes the sentimentalism and humanitarianism of the eighteenth century, and the separation of science from philosophy which is the characteristic feature of the nineteenth century. Interest centered round three main concepts—God, man, the world. Its problems were the nature of God, the nature of man's soul, the nature of inert matter, and it sought to discover by reflection and reasoning the relation of the soul to the body, and the relation of God to the soul and to the physical world. The philosophical thinking of the century ultimately crystallizes into two metaphysical systems, each logical and self-consistent, but based on antithetical principles and therefore offering us alternatives. The alternatives are determinism or freewill. The one is the system of Spinoza, based on the principle of one universal substance according to which individual freedom is illusion; the other is the system of Leibniz, based on the principle of individuality according to which freedom is actualized in real agents.

I will first, however, try to state clearly the exact distinction which I desire to make between theology and metaphysics, and generally between religion and philosophy. Both in theology and in metaphysics the appeal is to reason. It is *prima facie* obvious that an irrational theology is as impotent as an irrational metaphysics. The difference is not therefore in the tribunal before which they present themselves

for judgment. The difference is the principle on which reason is applied. Every human being entering on the age of reflection must by the very nature of his self-consciousness form for himself some conception of life and its duties. At every moment of active conscious experience he is confronted with the questions —not explicitly propounded but implied in all conduct—What am I? What ought I to do? The intellectual character of all human, conscious actions has two aspects, one theoretical the other practical, knowing and acting. In knowing and acting the whole of human activity is comprehended. The two activities are never separate, they are always linked together. Consciousness means that we know what we are doing, and intelligence means that we are acting in the light of what we know. It is because our life activity is so constituted that we describe ourselves as rational beings and distinguish our lives from the vegetative and instinctive modes of existence of which we see abundant examples in the world around us.

There are also two principles by which the exercise of reason by the individual agent is regulated. One is the principle of authority, the other is the principle of freedom. One enjoins faith, the other demands doubt. The two principles are not opposed to one another as positive to negative; also they are not reconcilable with one another in the sense that both can be in operation at the same time in the same act of thinking; yet they are linked to-

gether in a necessary relation, for they are stages or levels or moments in the developing mental life. In the natural order authority is prior to freedom, and in the logical order believing is the prerequisite of doubting. It is evident that no one can really doubt what he has not first really believed. So obvious is this that it finds recognition in every logical construction and in every metaphysical system. Immediacy precedes mediation as its condition. Before we can argue we must agree on the subject in dispute. The common-sense acceptance of the objective world must precede and condition the scientific reconstruction. Even a materialistic philosophy like Santayana's must postulate "animal faith," and the most naïve realism appeals to "natural piety." The reason is perfectly clear the moment we reflect on the conditions under which the independent human individual enters upon his activity and takes his place as a member of human society. The human being starts his individual existence in dependence, a dependence which is complete, on the overlapping generation of individuals. Every normal human being must pass through a natural stage of tutelage. One fourth of the average span of human life is passed in tutelage and education. I am not referring to the artificial acquirement of learning but to the natural education which changes the child into a grown-up. Life might have been contrived on a totally different scheme and still have admitted reason. It might, for example,

have been the case with rational beings that no generation could arise until the progenitors had perished, a phenomenon common enough in instinctive creatures. Had it been so, reason would have been ruled by other principles and human life would have been quite different in its mode. As it is, human reason is absolutely conditioned by the fact that it cannot be exercised freely unless it has first been disciplined authoritatively.

I can now explain how I conceive the relation between theology and metaphysics, the objective forms of religion and philosophy, insofar as they are distinguished by a difference of principle. The one is not inferior, the other superior, save only in the sense in which the higher presupposes a lower and a lower implies a higher. In principle religion and theology are prior in the development of the human individual mind to philosophy and metaphysics, and the latter presuppose and are dependent on the former.

What is true of individual experience is written large in the history of human thought. There is no more striking instance of it than the "new method" of Descartes which inaugurated the new era of modern philosophy. As we read the *Discourse on Method* we seem to feel humanity emerging from its childhood to its manhood, proudly conscious of itself and glorying in its strength, freeing itself from dependence on tutors and preceptors. This new confidence finds actual expression. "With the

ancients is wisdom." True, it replies, but it is we who are old. Those who to us appear ancient are the youth of humanity; we are its manhood. It is not a breach with the old, a casting off of respect for the ancient wisdom, it is the passing of childhood.

In the seventeenth century the philosophical interest turned definitely from theology to cosmology. It is easy to see why. The first great scientific discoveries were astronomical and the main task of thinkers was to rationalize the Copernican theory of the earth's movement. Yet this was no more than part of the task. The complete ideal was a theogony. That is to say, the ideal of philosophy was not essentially different so far as its scope was concerned from the ideal of theology. The distinguished philosopher and scholar, Étienne Gilson, who has made medieval thought a special subject of study, has recently put forward the thesis that the new method and the philosophical principles of Descartes were not an innovation but only the making explicit of what three centuries earlier had been quite definitely expressed in the writing of St. Thomas Aquinas and others of the Schoolmen. This in my view is simply a failure to understand that what is really claimed for Descartes as entitling him to be regarded as the father of modern philosophy is not any definite new discovery or novel doctrine but the new spirit in which he undertakes the old task, the new confidence which he infuses into his chosen method, and the new

principle which enters into his research. It is easy enough to show that all his characteristic ideas have borrowed the scholastic forms for their expression; he uses the ontological argument of St. Anselm and his famous *cogito ergo sum* is identical with St. Augustine's *si fallor sum,* but what everyone feels as he reads Descartes is the entirely new principle which is directing his thinking.

Let us now consider the two metaphysical systems, that of Spinoza and that of Leibniz, which in a peculiar way and apparently without direct consciousness of the fact in the minds of the authors expressed the great antithesis between the principle of determinism and the principle of freewill. Both are rational systems, dealing with the natural concepts of the mind and testing them by logical analysis without invoking any authority but that of reason.

The two philosophers present as great a contrast in their personality and character as in their philosophies. It is not unimportant to understand this difference, for there exists no more striking illustration of the relation of philosophy to life.

I will first sketch briefly the life and character of each and then explain the two metaphysical systems.

Spinoza, a Jew of Amsterdam, was born in 1632 and died in 1677, at the age of forty-four, of consumption. His life therefore was short and it was comparatively uneventful; he was

always delicate and much of his later years was a struggle against the disease to which he fell a victim. His mind was formed by his early religious training in the Hebrew Scriptures and the Talmudic writings, and when still a student he came under the influence of the philosophical works of Descartes. Religion and politics caused his alienation from his family and the Jewish community, and he sought refuge in philosophy. He supported himself by polishing optical glasses, at which he seems to have been proficient; his friends procured him customers, and otherwise he lived in complete seclusion. He became endeared to his few intimate friends by his gentleness and benevolence. He formed his ideal by philosophical reflection and practiced the doctrines of his philosophy.

Spinoza's chief work, that on which his fame as a philosopher rests, is the *Ethics*, a treatise written in Latin. It was not published until after his death, but it was known to his friends in his lifetime and the manuscript was loaned out to them. In his lifetime, and for the century and a half which followed his death, his name and his works were anathema. He was denounced as an atheist not only by his co-religionists, first the Jews and afterwards the Christians, but by philosophers who could not refuse to take his philosophical arguments into account. This charge was due primarily, and in his lifetime entirely, to the free criticism of the Bible which anticipated modern historical criticism of the texts. The more serious charge

against him by philosophers was the pantheistic principle of his philosophy which embraced fearlessly the logical conclusion which other philosophers were striving with all their ingenuity to avoid. It was not until the nineteenth century, with its revival of romanticism, that Spinoza was as it were rediscovered and came into the preëminent position as a philosopher which he is now seen to fill. With it however came the totally wrong idea that his doctrine was mystical. For this an often quoted phrase of the German writer Novalis is largely responsible. He described Spinoza as "God-intoxicated." It was however the Hegelian philosophy which first made clear the simple rationality of his system.

Leibniz (1646-1716) was a man of affairs. From youth to old age he was in the front rank of intellectual leaders. He was mathematician, historian, naturalist, politician, courtier, diplomat, philosopher. He founded the Academy of Berlin, he was librarian of the royal library of Hanover, he was the confidant of Louis XIV, he was the adviser of the Electress Sophia. Had the Electress lived a few months longer or had her son George I inherited any of her intelligence or shared her culture, Leibniz would have realized his greatest wish, to come to England with the court and be received into the learned circle of savants, the English Royal Society, of which Newton was the president. Leibniz was universally respected for his learning but was regarded everywhere with suspi-

cion and sometimes with open enmity. He was a man of amazing energy, and philosophy was a small and minor part of his ubiquitous activity. His most suggestive works and those which enable us to present his philosophy as a coherent system are without exception occasional—letters to the *Journal des Savants,* replies to correspondents, and the like. Even the famous *Monadology* was found among his papers and published some years after his death under the idea, which is not absolutely certain, that it is a summary of his principles written for Prince Eugene of Savoy, who is known to have requested it. One considerable work of philosophy which he published in the last decade of his life is the *Théodicée.* It arose out of a controversy with Bayle, of *Dictionary* fame, who had contended that it was impossible to reconcile the attributes of omniscience and benevolence in God. Leibniz in this work undertook to do so. His other philosophical work, the *Nouveaux Essais,* is a criticism of Locke's *Essay on the Human Understanding.* This was not published until fifty years after Leibniz's death.

These two men so extraordinarily contrasted in their lives were equally contrasted in their systems, and what is more important, the life of each is curiously reflected in his system.

Spinoza's philosophy is set forth in his treatise in a form which makes it peculiarly difficult for the student to apprehend and almost impossible for the ordinary reader to follow. This

is because for the sake of precision and logical force he chose to develop his argument, as he says, *more geometrico,* in the manner of Euclid's elements. He begins with definitions and axioms and then proceeds to build up on them a series of propositions with demonstrations, proofs, corollaries and scholia. His leading principle and the system he develops from it are simple and clear. I will try to state his fundamental doctrines in my own way and in the ordinary thought of today.

Whenever we reflect on our life and consciousness and ponder on the world around us in which our activity is exercised, it must seem to us that the variety and change and movement, alike in the world external to us and in the ideas within us, must have their support in an underlying reality, in an existence which does not itself appear but of which they are the outward manifestations. This is the idea of substance. It is an idea which arises in our mind as an ordinary, quite natural inference. It is not the idea of something we can be aware of like a sensible object, but of being or existence itself. It is not a casual or adventitious idea which may or may not be true. It is an innate idea. I cannot, for instance, think of myself as being simply the stringing together of my separate changing states, I must think of some self-identity which makes them mine, which makes me, me. It is the idea of an unseen and invisible substance which is my idea of existence. So too with regard to the world

in which I find myself and of which I am part; I can only think of its being by thinking of something I call its substance, and this I say is self-identical, depends on nothing else, has not to postulate some other reality as its ground. It is, and it is what it is. What then is this idea of all-sustaining existence, of universal substance, of an existence which contains existence alone as its essence? There is one name for it—God. We cannot help naming it God, for it is what we mean by God. To deny that it is God is to deny God. It is the God in whom we live and move and have our being. There can only be one infinite, and if substance is infinite then substance is God.

When now I begin to reflect on this God-idea a formidable difficulty presents itself. There are two kinds of reality, spiritual and material—minds which belong wholly to the ideal order and bodies which belong to the natural or material order. It would seem therefore there must be two substances, a spiritual substance and a material substance, each exclusive. The manifestation of the one is thinking, which is an internal activity, not occupying space and not interfering with spatial objects in their actions and reactions. The other is extended and all its activity is external action of one body on another. God is a spirit and we may identify thinking substance with God, but is material substance also God? Yes, was Spinoza's reply, for God is one and there can be no other. Two substances he argued is a

self-contradiction. If matter is independent of God, then God is not God; he is not infinite but effectively limited. If we define God as the infinitely perfect being whose essence includes existence, then there cannot be two substances.

How then does this fundamental principle of the one infinite substance, God, enable us to rationalize existence? In conceiving God as substance we are conceiving an inexhaustible source of being. We are finite creatures. We know God by two of his attributes, and two only. God has infinite attributes and is infinite in each attribute. He is manifested to us finite creatures under the attributes thought and extension, and this is why all reality has for us a twofold aspect, reality and ideality, materiality and spirituality. Everything exists in this double aspect and yet we cannot think that these two attributes exhaust the infinite substance, for infinite possibility as well as infinite actuality is in God.

What then, Spinoza now goes on to ask, are we men? What are finite individual creatures? We are, he answered, modes of the divine substance. The modes are the various forms in which infinite substance particularizes and individualizes itself. We are not self-subsistent individuals. Our individuality is the individuality of waves on the sea—shapes coming into being continually and passing out of being, dying away with no subsistence, no proper reality, of their own.

This brings us to our proper theme, freewill.

What is our apparent freedom? Why, if we are not free, do we feel free? The finitude of the individual modes, Spinoza answers, consists in this, that they are subject to the causal chain, they are without will, without resistance. They are under necessity. They are conditioned and determined not by themselves but by what is alien to them. We are not free. God is free because God is infinite, therefore unconditioned. Our illusion of freedom is that we are conscious of what we do but unconscious of the motive.

This then is the fundamental conception of Spinoza. He takes the position in philosophy which has its exact analogy in the Calvinistic doctrine in Christian theology, and the practical and moral doctrine to which the two lead are singularly alike. It is the theory of the grace of God. "Not I but God working in me." There is no good or bad in God, for nothing happens contrary to his will. Error and evil and sin are not positive or absolute, they are mere privation, negation, and due entirely to our finitude and restricted individual outlook. In what then does human good consist? How are we to answer the question, What ought I to do? How am I to know what is the good life and live it, seeing that all is under the iron chain of necessity?

Spinoza's answer is clear and noble and again recalls the Calvinist doctrine of regeneration. It takes a rational form. Let us consider, he says, what man finds most useful to himself,

what will contribute to his greatest good, what course of conduct will bring with it happiness and joy. For himself he answers it by taking stock of the things men value—riches, glory, honor. He has no hesitation in rejecting them all. One thing only is our true good—reason. It sets us free in the sense that it gives us the motive and the power to resist allurements, to unmask deceptions, and enables us to determine our own action in accordance with our knowledge. The highest knowledge is the knowledge of God. In this knowledge we are able to love God, not with emotional but with intellectual love. To love God intellectually is to love God with the same love by which God loves himself. It raises us from the life of sense to the life of intellect. Felicity is not the reward of virtue. It is virtue. It is the life of reason.

Spinoza's *Ethics* follows directly from his God-idea. He denies freewill in man because God does not act according to final causes but according to his nature. He identifies ethical conduct with rational conduct because reason gives us insight into God's nature. The love of God is intellectual love because God is not purposive and is not working for an end. On the other hand all efficiency comes from God. Final causes of God's action and freewill in human action are an illusion. All existence derives from God and returns to God. This is the point on which the mystical interpreters of Spinoza have seized, but it is not a mystical doctrine

just because everything which happens, happens by reason of God's nature and not by reason of God's will.

Let us now consider the other metaphysical system, that of Leibniz, which took form at the same time. It presents the most complete contrast to Spinoza's. Leibniz named it his new system of the preëstablished harmony. The word "new" was not used at all however in reference to Spinoza's system. Leibniz in fact thought out his philosophy without any relation of agreement or disagreement with Spinoza. The old systems which he had in mind when he called his a new one were the Epicurean philosophy based on the atomic theory and widely held by the followers of Gassendi, the direct action theory of the mind-body relation held by Descartes, and the occasionalism of Malebranche and Geulincx. It is only to us in retrospect that the two systems of Spinoza and Leibniz offer a striking contrast.

Leibniz is entirely in accord with Spinoza in the view that there cannot be two substances in the meaning of a dualism of mind and matter. Faced with the problem that there are these ultimate facts, thought and extension, mind and body, spirit and matter, and that they cannot be reduced to one another or identified on any intelligible scheme, Leibniz solves the problem in an entirely new and original way. Instead of declaring with Spinoza that matter because it is substance and insofar as it is substance is God, he rejects the idea that

matter is substance. Matter according to Leibniz does not exist in its own right. It is a mass effect of the mind's perceptions. When for example we say that we see a material object—a tree, a stone, a pond—what we see is never a mass of homogeneous stuff shaped in a certain way, it is an infinite number of individual activities, which a microscope would reveal in their individuality but which in our perception are blurred together in an obscure and confused heap. This leads Leibniz to a new concept of substance. It must express not the static appearance but the dynamic nature of existence. Substance is force, the power to do something. Anything which by definition can do nothing is nothing. Matter is pure inertia; it has no claim to be self-subsistent. It is only in the living world that we meet force, and there we must look for substance. The real world is a living world, a world in which every real constituent unit is active. Spinoza, as we have seen, had rejected purpose and declared freedom to be illusion. Leibniz on the other hand insists that freedom, final cause, purpose are the essence of living activity. Without these concepts organization and the *vis viva* which lies behind it are inexplicable. Final causes have no relevance to a static world of inert matter, but they are of the essence of the organic world.

In order to see how Leibniz comes to his new concept of substance we must consider how the concept of substance arises at all. There are

two questions which occur naturally to everyone who reflects on the problem of existence. The first is, What is this world in which we find ourselves? and the second, How comes it? The first is a question of analysis; the second is a question of genesis. To both these questions Leibniz has a definite answer. To the first he answers that the world consists of simple, active living beings and the relations between these living beings; the living beings are real and their relations are ideal. This he proves by pointing to the fact that the activity of every real individual is perception and therefore what unifies the world and makes it one is perception, and perception is ideal. To the second question, the question of the genesis of the world, how it has come into existence, Leibniz's answer is his idea of God. This God-idea, like Spinoza's, follows from his world-idea, but it presents the completest contrast. The world is purposive and its final cause is God. Purpose and finality imply the logical priority of idea to realization. If, for example, my action is the realization of a purpose, the purpose must have existed ideally before realization. The world is the realization of God's purpose and witnesses to his wisdom and power. We must conceive God as infinite in knowledge, that is, omniscient; and infinite in power, that is, almighty. The world is not the product of an artificer who, like a potter, models vessels of clay; it is a realm of free spirits each expressing in action its own nature, limited only by the activities

of other spirits. In creating free spirits God does not create their actions nor determine them, but actions are the expression of a nature and God's omniscience enables him to foreknow what their actions will be. Their freedom is not negated, their responsibility is not impaired, but in creating them God foreëstablished their harmony.

In these two systems we have the most complete attempts of the human mind to work out by pure reason the scheme of the universe and the source and destiny of human existence. Each system is logically consistent. Neither appeals to any other authority than that of reason. And yet they reach antithetical results. It would not be true to say that their conclusions are mutually contradictory, but their principles are opposite and their systems are divergent in their direction and in their outlook. It is interesting and of the highest importance, if we would see the true inwardness of the problem of freedom, to compare them. When we do so one thing comes out with increasing clearness, the impossibility of dissociating the nature of human freewill from the God-idea. What I mean is that freedom in man is not to be decided once and for all as a question of fact by appeal to experience; if it is truth, it is a truth of reason to be understood only in the light of our concept of the universal existence which is the source of our being and which we name God. Human freedom is not a mere detail of what we may call natural his-

tory, something which we can discuss by itself as a quality or character or endowment of the particular form of animal organization which we distinguish specifically as *homo sapiens*. It is a world-problem, or rather a God-problem. The value then of the intellectual work of the two philosophers we are now considering, Spinoza and Leibniz, is that it raises the problem of freedom from a theological dispute to a metaphysical level.

Let us then first compare the two God-ideas. For Spinoza God is the inexhaustible source of existence, the infinite substance, whence all comes and to which all returns. This has generally been condemned as a pantheistic conception. It is pantheistic in the meaning that it conceives God as immanent in the world and the world as emanating from God. It rejects moreover the idea of creation and refuses to allow anything in the nature of arbitrament in the divine nature. But against any facile condemnation of pantheism on the ground that it is the simple identity of all that is with God it should be observed that such a simple identity is far removed from Spinoza's thought. Mind and nature are, according to his doctrine, substantially identical with God, but God is not identical with mind and nature. God's existence and God's activity are not exhausted in their expression under the attributes of extension and thought. God is infinitely more. When we have regard to Spinoza's insistence on the infinite attributes we see that in its philosoph-

ical statement it approaches very closely to the God-idea which underlies the Calvinist theory and is elaborated in its theology. If however pantheism be given a meaning indistinguishable from atheism, that is, if we insist that the proposition "God is all in all" shall be convertible with the proposition "everything is God," then indeed we may claim a dialectical victory, but it will have been gained by suppressing the real significance of the doctrine. This is the theoretic aspect of the problem; there is a practical aspect. If God be conceived as substance clearly he cannot be presented in idea as a personal being, possessed of thoughts, desires and purposes, deliberating as to means and ends, thinking, willing and acting. If we accept Spinoza's God-idea, then to present God to our mind under a personal form is not merely to think anthropomorphically, it is to think God in a thought which contradicts the God-idea. Yet Spinoza cannot avoid the practical problem. He has to meet the fact that whatever our theory we actually conduct our lives as though we were free to choose and responsible for our choice, and we can only think of God as though like us he were forming purposes and devising means to execute them, however infinitely beyond our comprehension they may be. Let us admit at once that to declare all this to be illusion is not so startling as it first appears because it is admitted by everyone that in some sense all description of God, imaginal or conceptional, is anthropomorphic. When we

say "thus saith the Lord" we do not really think that God has a body and members of his body which obey his will, or that he expresses his commands in articulate speech; but how without the aid of some imagery can we express our idea of his activity? Spinoza does no more than extend this obvious criticism of our natural anthropomorphism to our concept of finality. In attributing to God perfect efficiency he finds that he has taken the meaning out of finality. In this too he can appeal to the tradition of his own race, the commandment "Thou shalt make no image of the Lord thy God." God in Spinoza's view is free, but free in a different meaning of freedom from that which would attribute to him choice and arbitrament. God is free because God is absolutely unconditioned; God is free because all efficiency and therefore complete determination is included within the God-idea. Man's apparent freedom is illusion, the consequence of the double aspect of his activity, ideal and actual, for this makes man's consciousness of his actions partial and one-sided. Since man is a mode or modification of the divine substance, he must like every mode be involved in, enchained in, the infinite series of conditional causes. Every bodily function and every mental function must have its determining cause. The possibility of reconciling this metaphysic with a doctrine of moral responsibility is of practical interest but does not affect the metaphysical theory itself.

Let us now turn to Leibniz's doctrine. For him as for Spinoza God is substance and God is cause, but the initiation and whole direction of his argument is different from Spinoza's. He allows there cannot be two substances of different kinds, but he denies that there are two kinds of reals to be unified in one substance. There are no material things, there are only minds and their ideas, or to use his own terms, minds and their perceptions. Matter is not substantial because it is not simple and it is not indivisible. On the contrary there is no limit to its divisibility. Only a mind is indivisible and simple, and therefore minds are the simple reals which compose the world. There is a world and in this world there are presented to us two orders; an order of nature, a realm of efficient causes; and a moral world, a realm of final causes or ends. It is to harmonize these two orders and not to unify two kinds of realities that we must conceive God. Thus we see that Leibniz's argument reverses the direction of Spinoza's. Instead of deducing the modes of God's attributes from the idea of God, Leibniz infers from the harmony of two different orders the author of nature. Leibniz's God-idea is also in striking contrast to Spinoza's. While Spinoza argues that there cannot be more in the world than is already existent in the substance of God, Leibniz argues that there must be more in God than actually exists in the world, for everything in nature is contingent, that is, everything that happens

might have been other than it is. In God, therefore, besides the actual there is the possible. This is the key to the whole conception of Leibniz and it is essential to understand what it implies. To see its force we have only to turn our attention to our own mind. What do I mean when I claim to be a rational soul or mind? What difference am I affirming that reason makes between my soul and that of an irrational creature or even an unconscious plant? The difference is that I have at my disposal possibilities which they have not. They are determined by actualities; I have possibilities over and above the actualities. My action is deliberate while theirs is immediate and externally predetermined. And what finally determines my actions? My knowledge. According to the completeness of my knowledge in directing the efficiency of my causality is the harmony of my actuality. Transfer this concept from the finite sphere of my activity to the infinite sphere of God's activity and at once the God-idea of Leibniz shines forth. God's attributes are not thought and extension but omniscience and efficience. God is pure spirit because he is infinite and his ideas are adequate. In God are all the possibilities and therefore he can regulate the order of the universe in advance of its existence. Thus Leibniz's God-idea takes essentially the personal form, and at the same time, by the infinity and perfection which he must attribute to it, it transcends the finitude of human existence as

completely as the Spinoza idea of the infinite substance transcends the finite modes. How then does Leibniz conceive the activity of God? Again we are struck by the contrast to Spinoza. God is essentially reason raised to infinity, and the activity of reason is discursive. Discourse is only fully realized between free, independent, responsive minds. Consequently in the nature of God is the need of creation. This need cannot be met by the idea of an artificer fashioning creatures as a potter fashions vessels of clay, it can only be met by the creation of free spirits with their own nature and perceptive activity able to share in the discourse of reason. The creation of the world therefore was not, as Descartes held, the imparting of movement to extension; it was the actualizing of natures each of which had been considered in its possibility with a view to the harmony of its activity. Every such creature is a living mirror of the universe. This universe itself is a spiritual hierarchy of individual living creatures, each active in perceiving and all differing in degree, from the lowliest order of simple monad with completely confused and obscure perception to the rational soul of man, living image of the creator, able not only to perceive clearly and distinctly but even to comprehend the system of the universe and in its way to imitate it, a divinity within the divinity.

I have given no more than an outline of these two great intellectual systems with their opposite principles of interpretation. They

present to us the completest contrast in their conception of the nature of freedom. We can, I think, in each case indicate the source to which each philosopher has gone for his principle and the reason for its dominance in his system. Spinoza takes his idea of cause by analogy from what in his time was the science of mechanics. Consequently for him cause is identified with the notion of efficiency, for the idea of finality has no place in the general system of nature as a mechanism. Thus cause becomes for Spinoza the notion of efficiency and every effect in nature is absolutely and exhaustively reflected in the cause. Accordingly the appearance of finality in nature and of freewill in man can only be an illusion which fuller knowledge would dispel. Leibniz on the other hand takes his idea of cause from reflection on the organic world, and the contrast is complete for the concept of *vis viva,* which was the form in which Leibniz's thought found expression, while it depends on efficiency yet cannot be interpreted without finality. In fact, suppress the idea of design and purpose and the concept is meaningless. In Leibniz's time the utter failure of the Cartesians to convince the world that animals were only complex machines without feeling or thought was notorious.

There is however something not a little curious in the fact that, while the two principles are diametrically opposed, their practical outcome in religion and ethics is one and the same. Consider for example the two concepts of God.

Spinoza rejects final causes, will allow no shadow of purpose, neither design nor goal, determining the activity of God. The one substance is eternally complete and self-sufficient. Yet this very definition of complete determinism turns out to be the definition of freedom. God alone is free, for God is the unconditioned.

Leibniz starts from the opposite pole. God is free because he is supreme reason with distinct perceptions and adequate ideas. But reason is the recognition of purposes, designs, final causes. The rational mind is the mind which can know things ideally in advance of actualization. Freedom is the power to choose among ideal possibilities the one which shall be realized. In God there is perfect freedom because in God infinite wisdom accompanies infinite power. Is then, we ask, God free to do evil? Can he choose that evil shall be good? Yes, we reply, if we consider abstractly only God's infinite power. No, if we remember that his power is accompanied by omniscience. That is to say, it is not because God is good that he cannot deny his nature and do wrong, it is because wrong is irrationality, and God, infinite in knowledge and power, is reason. If then God creates a world we may know by the concept of God that the world created will be the best of all possible worlds, not because he could not create a worse, but because all possibilities are open to him and adequately represented in idea, and infinite goodness must coin-

cide with infinite wisdom. Though God is infinitely free, yet he is absolutely self-determined and from eternity. So whether we follow Spinoza or Leibniz the result is the same.

This theoretical opposition and practical identity is no less striking when we consider freedom in man. The good life, the *summum bonum* for man, is not essentially different in the two philosophies. In each system error and evil are negative, the result of a limited outlook on reality. In each system salvation is to be sought in knowing God and in viewing reality as God views it. For Spinoza however the salvation which knowledge brings is the dispersal of the illusion of freedom, with all the false notions of happiness which attend the indulgence of ignorant desire. For Leibniz reason is what assures us of freedom, but the one great use of freedom is that it establishes our intercourse by ideal relations with our fellow men and with the Author of our being. The higher we rise in this knowledge the more our freedom becomes the self-determination which is the ideal of Spinoza.

III

EMPIRICISM AND THE RISE OF THE IDEA OF A NATURAL RELIGION

We have now to trace the effect on the free-will problem of a new orientation in thought. Mankind has always been impatient alike of theology and of metaphysics. This is not because the generality of men are too engrossed with practical interests to value the fine intellectual fruits of rational speculation concerning the nature and origin of things, and it is not because the majority of cultured men are too dense in their intellectuality to find support for the gossamer constructions of the abstract realm of ideas. It is neither from the man of the world nor from the religious or educated class that the revolt against metaphysics comes, it is from the keen observers of nature, from the scientific investigators engaged in research. They are continually protesting against the philosopher's achievements and pouring contempt on philosophy. It is Sir Isaac Newton who warns physics to beware of metaphysics; it is John Locke who inaugurates the new method in philosophy which is to reverse the

method of metaphysics; it is Voltaire who launches against the metaphysicians the envenomed shafts of his wit and covers them with ridicule; it is Jean Jacques Rousseau who proclaims the new emancipation of the human mind.

The seventeenth century was the great age of metaphysical speculation, and France was the country in which it flourished. Paris in the seventeenth century was recognized as the intellectual metropolis. In the eighteenth century under the leadership of English philosophers philosophy took a new direction. England became the intellectual center of Europe and the new principle of the English philosophers—empiricism, the direct interrogation of experience—became the recognized path of intellectual advance. Empiricism developed into scepticism under Hume, but it had wide and far-reaching effects and led to the rise of a new sentimentalism and to the conception of natural religion, finding its fullest expression and influence throughout Europe in Rousseau. The interest centers in the conception of human freewill, but the problem is now treated from a new and entirely different standpoint.

It is not merely accidental that in the seventeenth century intellectual leadership is in France and in the eighteenth in England. The external reason is political. In the seventeenth century England was distracted with civil war, France was leading the Catholic reaction, and the court of Louis XIV was the diplomatic and

military arbiter of Europe. Toward the end of the century the position was changed. The English Revolution of 1688 had not only made England the land of toleration and constitutional freedom, but had placed on the throne a ruler, William of Orange, who was mainly concerned with destroying the leadership of Catholic France and establishing a new balance of power in Europe. The inner reason, however, is to be sought in the character of the Anglo-Saxon mind as compared with the mind of the Latin race. The English have always manifested a strong practical bent and it expresses itself in their science and philosophy. Locke and Newton are more than original thinkers, they are characteristically Anglo-Saxon thinkers. They represent the strong Anglo-Saxon bias to practical material fact and impatience with impotent speculation, a contempt for those who

> reasoned high
> Of providence, foreknowledge, will, and fate,
> Fixed fate, free will, foreknowledge absolute,
> And found no end, in wandering mazes lost.

"Man is born free, he is everywhere in chains." This clarion call of Rousseau is the form in which the problem will now present itself. The bondage under which man groans is no longer the bondage of the law from which, according to the Pauline preacher, Christ Jesus has come to set us free. It is not the bondage of a finite nature which, according to the Cal-

vinist, may be changed to freedom by reception into the family of God's elect. It is not the metaphysical bondage of a causal chain in which every action is determined, and freedom an illusion or mirage. It is the bondage of social, political, economic and religious sanctions; the bondage of superstition, of priestcraft, of kingcraft; the bondage of custom. Man has forged his own chains, and man alone can work his own emancipation. The task is not hopeless or beyond his powers. Nature is beneficent, not cruel. Man has only to claim his birthright, to guide himself by the natural law of his being, to trust the illumination of reason, not cringing before unseen terrors, nor suspecting retributive and avenging powers lying in wait for him, when he follows the natural dictates of his being. This was the ideal. Its realization was far from simple and only to be gained by a radical reform of all the methods of education. For is not man himself the sole cause of his own degeneracy? "All is good as it comes from the Author of Nature, all degenerates in the hands of man." Leave a man to himself among his fellows from his birth, he will be the most deformed of them all. Prejudice, authority, necessity, example, all the social institutions in which he finds himself submerged, would choke his original nature and put nothing in its place. He would be like a shrub which had sprung up by chance in the middle of a thoroughfare. Nature cannot protect it from the injuries it will receive from

the passers to and fro, tearing it and bending it now this way now that.

We have a new contrast, the contrast between nature and artifice. Nature is good and bears witness to the goodness of the author of nature; man alone of the works of nature is degenerate, and this is on account of his abuse of reason to distort the good. Man alone is discontented with things as they come from their maker's hands. "Man mutilates his dog, his horse, his slave; he upsets the balance of everything, disfigures everything, loves deformity, makes monsters. He will leave nothing as nature makes it, not even man himself; man must be groomed for him like a stable-horse, trimmed to his fashion like a clipped garden tree."

We are now to look at the philosophical basis of this change in the ideal of freewill. We will confine our attention to the philosophers and the historical development of the philosophical doctrine.

The greatest influence by far in producing the natural religion, or the religion of natural reason, which dominates the intellectual life of the eighteenth century, is without question Sir Isaac Newton. It is not usual to rank Newton among our philosophers, but in his own day and to the generations which followed his death he was regarded as the English philosopher par excellence. This was not because in his time there had occurred no dichotomizing of the sciences, no separating the natural and physical

sciences from the mental and moral, but because his achievement in mathematical and physical science stands out preëminently as the evidence of the mighty power of the human intellect in its comprehension of nature, needing to appeal neither to revelation nor to magic nor to the occult. Newton's own faith, his personal religion, was as far removed as we can imagine from the faith of Rousseau's good Savoyard Vicar, founded on the dictates of nature. Newton believed in the verbal inspiration of the Bible and studied his Bible with unquestioning faith. It is probable that he valued his calculations of biblical chronology and his discoveries of the allotted duration of the present dispensation, which he believed had been disclosed in the prophetic and apocalyptic writings, far more highly than he valued his discovery of the law of gravitation, and yet but for Newton and his natural philosophy the world would never have known the faith of the Savoyard Vicar. What was this work of Newton which was to effect a change in faith? By simple observation, by natural reasoning and by careful measurements he had discovered a formula which applied universally. It would determine the path of the moon round the earth, of the earth and other planets round the sun, with the exact precision and accuracy which it could bring to the calculation of the fall of an apple in an orchard. It brought the whole vast, infinite universe within the grasp of a human mind by virtue of a law of gravi-

tation which held good wherever it could be applied. And this great achievement had been won without metaphysical excursions into first principles or deductions from theological dogmas. It was a triumph of human reason such as the world had not hitherto known. Let me quote his own account of his work at the close of the *Principia Mathematica:*

> So far I have explained the phenomena of the heavens and of our sea by the force of gravitation; but the cause of gravitation I cannot determine. It is a force which arises everywhere as an effect of some cause which penetrates even to the centers of the sun and the planets without diminution of strength; and it does not like mechanical causes act in proportion to particular surfaces, but proportionately to the quantity of solid matter; and its action extends on every side to immense distances, decreasing continuously according to the square of the distance. Yet the reason of these properties of gravitation I have been unable to deduce from the phenomena, and I make no hypotheses. For what is called a hypothesis is a reason which is not deduced from the phenomena, and in experimental philosophy hypotheses, whether they are metaphysical, physical, occult, or mechanical, have no place. In experimental philosophy propositions are deduced from the phenomena and general laws are obtained by induction. Thus impenetrability, mobility, the impact of bodies and the laws of motion and of gravitation have been formulated. It is enough that gravitation exists in fact and acts according to the laws I

have explained, and that it accounts for all movements of celestial bodies and for the tides.

Today, two hundred years after his death (March 20, 1727), though science has invaded realms he never dreamed of entering and when mathematics has won triumphs which are making his principles seem old-fashioned and his theory outworn, he stands before us as a gigantic genius.

The *Principia Mathematica* was published in 1686, and Newton rose to the highest fame in England. He was president of the Royal Society, an office to which he was reëlected annually for the last twenty-five years of his life. Everywhere he stood acknowledged as the world's greatest philosopher. Yet it was not until fifty years after his great work and seven years after his death that the significance of his philosophical method was recognized and turned against the metaphysical systems of the philosophers. This was the work of Voltaire.

There are some curious pages in history. One of the most extraordinary facts, to us almost incredible, is the story of Voltaire's *Élemens de la Philosophie de Newton.* It was the first attempt to popularize his work. Newton wrote all his mathematical and physical treatises in Latin, with the single exception of the *Optics,* which was written in English. There was not—and so far as I know there still is not—a complete translation of the *Principia*

in English. The passage I have just quoted I translated myself from the Latin. The work of our greatest Englishman therefore first became known to the world outside the Academies in a French account of his philosophy. Voltaire could not publish this work in Paris, because the authorities, when they understood that the Principles were opposed to the Cartesian cosmology, then accepted as orthodox, refused permission. It was brought out in Switzerland. It had an extraordinary success. Editions followed one another, and it had the effect of establishing the Newtonian system as the recognized basis of physical science.

The work may be read with interest today. It is curious however not so much for the account it gives of Newton's physical theories, as for the direction which Voltaire gives to their implication, a direction which we feel Newton himself would have warmly repudiated. The whole trend of Newton's philosophy as Voltaire interprets it is toward the principles of Natural Religion. He defends Newton against the charge which Leibniz had brought against the system, that it supposed faulty construction and immature workmanship in creation, for the world according to Newton's scheme required constant tinkering and general supervision on the part of the creator to keep it going and prevent it from running down. What Leibniz had called faultiness Voltaire extolled as the very essence of nature which is forever producing perishable existences from

its fertile womb. Nature is not characterized by the metaphysical perfection of geometry. There is a freedom, an exuberance, in all her works. The supreme architect is not therefore the God of Leibniz who has brought into existence the best of possible worlds, a world which can undergo neither origin nor destruction save as one whole. Nature inspires us rather with the idea of a romantic freedom, of the endless possibility of new forms, all however witnessing to benevolence, enjoyment, well-being, goodwill. The criticism of the law of gravitation that it is a finite process tending to extinction, is turned to the praise of the endless possibility of new world systems in the infinite void. We see emerging a new idea of freedom, consonant with the conception of an exuberant, beneficent nature, and in a short time it will dominate the whole intellectual world.

Let us now consider the more direct influence which turned the current of philosophical speculation into a new channel. This was empiricism, the new method of directly interrogating experience which was to replace the old method of deducing the nature of God, the soul and the world by analysis of our rational concepts. Instead of metaphysical speculation philosophy is to engage in critical observation of experience itself. The founder of the new method is the English philosopher, John Locke.

Empiricism arose as a reaction against the philosophical method which had been initiated

by Descartes as the method of doubt. The basis of the Cartesian doubt was the untrustworthiness of the senses in the search for truth. This is easy to understand when we take into account the determining cause and inspiring motive behind the development of modern philosophy, the necessity which the Copernican discovery had imposed on human thought to adapt itself to a new world scheme. The human mind had to familiarize itself with the fact that what appears self-evident, or what is given immediately to feeling and perception as truth, is not reality but illusion. In fact we conduct our lives under persistent illusions which we cannot disperse by appealing to sense experience. Philosophy accordingly began with the method of doubt. We cannot trust our senses, for they deceive us. Our senses make it appear that the sun moves and that the earth is stationary, but we know that the earth moves. Our senses refuse to let us think that there are antipodes, and yet we know that all inhabitants of the earth regard the center as below and the firmament as above. To know truth we must turn from the senses to reason, we must form rational concepts. Why then have we sense organs? Is God a deceiver and has he endowed us with senses in order to prevent our knowing truth? The answer could only be that we were misunderstanding the value of the sense organs and misinterpreting their purpose in regarding them as means of knowing truth. They are designed for bodily

preservation, they have utility value in keeping the organism from destruction. It was an unsatisfactory doctrine and curious speculation came to center round it, but it held its own throughout the great period of metaphysical system-making which we have passed in review.

Locke began his great work with an attack on the theory of innate ideas. An idea he defined as the immediate object of the mind when it thinks, and all ideas come from experience. There are no ready-made ideas in the mind. All come directly from without as impressions on the sense organs or by reflection of the mind on its own processes of apprehending and reasoning. The mind itself before experience is like a clean tablet, a blank sheet of paper, ready for impressions or marks to be made on it, active only in its sensitiveness. Knowledge is built up of the awareness of sensations and the reflective processes to which they give rise.

This new method of direct appeal to experience, and the new principle that all knowledge whatever arises in experience and refers back to experience, required a new basis for the authority of religion.

Locke himself was perfectly simple and direct. He found no difficulty whatever in the idea that the brain thinks. He saw no reason to suppose the mind was anything else than a general association of the various functions performed by the brain. He rejected the idea that we have a natural intuition of God's

existence, or any knowledge of what philosophers call eternal truths. The case of revealed religion was of course never in question, but natural religion was the result of reasoning on matters of fact. The existence of God could be proved, but by ordinary demonstrations or reasonings on matters of fact.

It is very curious to follow the new movement in its development. It was hailed by Voltaire as a return to sanity. It seemed to the whole intellectual world an eminently rational method. By going to the source of knowledge in actual experience instead of speculating in the void it seemed as though at last it must be possible to raise an edifice of truth on the solid rock of reality. It is interesting to compare the different directions which the successors of Locke followed. In France it produced the sensation theory of Condillac, and he was followed by a long line of theorizers, known as ideologues, who sought to build up experience out of unit sense constituents. In England, on the other hand, it led Berkeley to criticize and reject the idea of material substance, and later it led David Hume to challenge the idea of a necessary connection between causes and effects. Experience was finally analyzed into a stream of unconnected impressions and ideas without any principle of necessary connection at all or any ground for inferring an *esse* or a *posse* behind the *percipi*. The result was a scepticism in regard to knowledge profounder and more disconcerting than

any doubt which had hitherto confronted the philosopher. Hume's scepticism is as arresting today as it was in his own time, though it is science rather than religion which is called upon to grapple with it.

Our present interest however is in the effect of this empiricism on religious thought and on the conception of freedom as characterizing human nature. From this viewpoint the outstanding interest of the eighteenth century is the dominance of the idea of natural religion. Its appeal is sentimental, but it is so powerful that practically it submerges the interest in revealed religion. Anyone in the eighteenth century who had dared to avow himself an atheist in regard to deism or natural religion would have outraged public opinion far more seriously than by any rejection of the authority of Scripture.

Let me mention a few of the works which by their wide range and influence serve to illustrate the inundation of sentiment which gives so marked a character to the religion of the eighteenth century when compared with the theology of the seventeenth century and the scientific materialism of the nineteenth. Pope's *Essay on Man* was published in 1733. Pope was the close friend of Jonathan Swift, the great satirist and dominant force in the English literature of the early part of the eighteenth century. Swift had in fact cleared the ground, so to speak, by his fierce indignation against theological shams. *Gulliver's Travels* was

published in 1726. Pope represents the new sentiment, and his *Essay on Man* may be read as the credo of the new natural religion.

Fielding's *Tom Jones* appeared in 1749, the first great English novel and the best. As we read it we are conscious in every line of the religious background. The satirical sketches of the parson Thwackum and the philosopher Square derive all their force from the new sentiment.

It is however Rousseau's *Emile* which was to become the authoritative expression of the new conception of Natural Religion. This book was published in 1760, and although it aroused such resentment in orthodox circles that Rousseau had to seek safety in exile its influence was enormous and became triumphantly evident in the ideas which thirty years later inspired the leaders of the French Revolution.

To understand the appeal of this plain, straightforward, direct, unadorned work of genius, one must read it. The whole book may be said to center round the profession of faith of the good Savoyard Vicar. I will quote from this profession the conclusion:

> You can see in my profession of faith nothing else but natural religion: would it not indeed be strange if any other were needful? By what sign should I be made aware of the necessity? How can I be guilty in serving God according to the feelings implanted by him in my breast? What purity of moral, what dogma useful to man and worthy of his author can I

derive from any doctrine taught me positively, that I cannot derive without it simply in making right use of my faculties? Show me what can be added to the duties of the natural law, for the glory of God, for the good of society and for my own advantage, and what virtue you can make to spring out of a new religion which is not already a plain consequence of my own? Our noblest ideas of the divinity come from our reason alone. Look round on nature, listen to the voice which speaks within. Has not God said all there is to say, to our eyes, to our conscience, to our judgment? What more is there for men to tell us? Their revelations only debase God in giving him human passions. Far from clarifying our notions of the Supreme Being I see only particular dogmas which confuse them; which far from ennobling them, degrade them; which to the inconceivable mysteries surrounding them add absurd contradictions; which make man proud, intolerant and cruel; which instead of establishing peace on earth bring fire and sword. I ask myself what good is there in all this and there comes no reply. I see only men's crimes and the miseries of the human race. They tell me that a revelation is necessary if we would know how God would be served; and in proof of the necessity they point to the diversity of extravagant cults which they have instituted, and they fail to see that this diversity proves the fantasy of the revelations. When people want to make God speak, each makes him speak in his own manner and say what he wishes. Had we listened only to what God speaks in the heart of man the world would have had but one religion.

The remarkable thing about Rousseau is not so much the expression he gave to the ideal of natural religion as the extraordinary influence which he exercised on the age and its effect in determining the directions of the spiritual motives which underlie human actions. The eighteenth century closes with the two great dramatic historical events which mark the end of a political era and the opening of a new, events which determined the form of the social and political world in which we are living today—the American War of Independence and the French Revolution. It is easy for us, now that we can take in the historical perspective to see that the War of Independence was not a parochial dispute allowed to develop, mainly by folly and mismanagement, into a gigantic and ruinous conflict. The victors were not the only gainers. When the colonies of the New World won their independence the peoples of the Old World gained a political freedom they had not directly fought for. The War of Independence was not determined purely by the chance result of the clash of physical forces on the battlefields but by the spiritual ideals which had found a home in the minds and wills of men. The sentiments which inspired the faith and devotion of the generation which accomplished those soul-stirring deeds found their finest expression in that remarkable genius, Rousseau.

No one reads Rousseau today unless it be out of a purely literary interest. If we do turn

to him for the philosophical or historical interest of his work we become conscious at once that it does not grip us. The hold which it had on his generation has lost its force. His conception of nature is for us shallow, unreal and pure illusion. Its sentiment is mawkish, unmanly and false. When as often we hear echoes of it in the sermons of popular unorthodox preachers it does not ring true. We have learned to look differently on nature, to think differently of the author of nature, and more particularly to realize our power over nature. In the eighteenth century however the ideal of natural religion as the ingenuous attitude of man toward the beneficent power which had given him birth was all but universal. It held the field and all the great thinkers of the age did homage to it. The Christian writers were for the most part engaged in apologetics and special pleadings. They seem particularly interested in discovering indirect arguments and finding ingenious illustrations in support of the rationale of revelation, and all their reasoning is directed to fanciful analogies. Paley's *Evidences* and *Natural Theology,* Butler's *Analogy,* Warburton's *Divine Legation of Moses* are typical of the ecclesiastical apologists working, often with a sense of being heavily handicapped, against a background of natural religion.

There is one exception. David Hume dared to challenge the whole argument for natural religion and on its own ground. He attacked it

not with satire or ridicule but with his unruffled, cool common sense, with direct argument and good humored reasoning.

The most illuminating book for the philosophical student who wishes to understand the mind of the eighteenth century is Hume's *Dialogues Concerning Natural Religion.* The story of this book and its publication is itself significant. It is Hume's most finished work and one which he valued highly as the ripest expression of his philosophical principles. It was not published in his lifetime nor till four years after his death. What is more, it was Hume's own wish that it should not be published until after his death, for it is the subject of a special instruction in his will. He appointed as literary executor his friend Adam Smith, and he left all his papers and manuscripts to him to deal with according to his own discretion, with the exception of his *Dialogues Concerning Natural Religion,* in regard to which he was given no discretion. This work was to be published forthwith and a sufficient sum of money was set aside for the purpose. The will further gave instructions that, if for any reason the book had not been published within two years following his death, it should revert to his ordinary executors, his nephew and another relation, who were instructed to publish it forthwith. The sequel is strange. Adam Smith deliberately refused to publish it and forfeited the legacy attached to the carrying out of the duty. When the two

years had elapsed the nephew sought to carry out his uncle's instructions but could not find a publisher who would accept the responsibility. It was not till two years later, that is, in 1779, four years after Hume's death, that at last the book appeared. What was the ground of this extraordinary difficulty? It has puzzled the literary critics to find any reason, at all events any obvious reason, for the refusal of Adam Smith to offer, and the reluctance of publishers to accept, one of the most elegant productions of the age. If you read it you will find that from beginning to end there is no attack open or veiled on revealed religion in general or on Christianity in particular. Yet there can be no doubt that Adam Smith was not moved by any personal motives, but purely and only by anxiety to preserve the goodwill and respect of the world toward his deceased friend. We shall not be wrong, I think, if we see in Adam Smith's concern for his friend's reputation the clear indication that at that time scepticism in regard to natural religion was far more shocking than scepticism in regard to revelation. To us today the deism of the eighteenth century seems hardly distinguishable from the atheism of the nineteenth century, but in the eighteenth century atheism in opposition to deism appeared as a sin against nature.

If the story of the book is strange, the book itself is stranger than its story. Probably no philosophical argument on the subject of religion has proved quite so baffling to the

critics who have sought to come to terms with it. Indeed in what I am now going to say I am offering my own interpretation of what in a certain measure has challenged philosophy as a riddle of the sphinx. The book is a continuous dialogue divided into twelve parts. The interlocutors are three friends, Demea, Cleanthes and Philo, who are met in the library of Cleanthes. Demea is the champion of the orthodox philosophical arguments and metaphysical proofs of the existence of God. Cleanthes is the modern empiricist who relies entirely on *a posteriori* arguments, makes frequent use of analogy, and whose strong proof of natural religion is the evidence he finds of design in nature. Philo, representative of Hume himself, is the sceptic whose scepticism, however relentless it may seem, is always generous. The argument is mainly between Demea and Cleanthes, the defenders respectively of the old theology and the new natural religion. Philo, the sceptic, supports now one and now the other, and his main purpose is directed to prove that the *a posteriori* argument, notwithstanding its humanistic aspect and strong appeal to experience, is no more fitted than the *a priori* argument to lead to an indisputable conclusion. If there is ground for religion its basis can only be revelation, and the proof of revelation must rest ultimately in miracle not in reason, for the acceptance of the revelation supposes an act of faith beyond the power of man to exercise. The act of faith is

contrary to nature and therefore itself a miracle.

It will be seen therefore that the sceptical argument has a most important bearing on the freewill problem. It concerns the nature of the act of faith which leads us to give our assent to creeds or articles of belief which in any manner contradict our natural beliefs in regard to matters of fact. In order to see the force with which the application of Hume's philosophical principle is brought to bear on the freewill act we must follow the argument in its full development.

The dialogue opens with the practical problem, "How are we to bring up children religiously if the truth of religion depends on metaphysical, ethical and theological reasoning, which suppose a high intellectual attainment? Natural theology being the most profound and abstruse of the sciences requires the maturest judgment in its students. It seems therefore that if we follow the natural order religion will come last, not first, in education. The reply is that it is the science and not the practice of piety which is postponed and there is no surer safeguard against profane liberty than to abandon ignorance. "Let us become thoroughly sensible of the weakness, blindness and narrow limits of human reason; let the errors and deceits of our very senses be set before us; the insuperable difficulties which attend first principles in all systems; the contradictions which adhere to the very ideas of matter; cause and

effect, extension, space, time, motion; and in a word quantity of all kinds, the object of the only science that can fairly pretend to any certainty or evidence. When familiar objects are found to be inexplicable, with what assurance can we decide concerning the origin of worlds, or trace their history from eternity to eternity?" This concentrated statement of the principles of Hume's philosophy raises a suspicion of irony. Can it be seriously proposed to erect religious faith on a foundation of philosophical scepticism? Is scepticism really distinguishable from atheism?

This introduction at once leads to the main theme. Surely it cannot be necessary to defend the Being of God against atheists and infidels. No man of common sense can entertain serious doubt as to the Being of God; the question can only be as to his nature, to know which may transcend the power of the human mind. The *a priori* arguments may claim to have established this. Nothing exists without a cause; the original cause of this universe, whatever it be, we call God; and we piously ascribe to him every kind of perfection. Unfortunately however the metaphysical arguments, although they are unassailable, are quite unconvincing. To deny them may bring down on us the ridicule, contempt and disapprobation of philosophers, but they make no appeal to the practical man. It is different with the argument from design; this is an *a posteriori* argument and the only valid one for those whose concern

is with matters of fact. We have only to look around us at the world to find everywhere in the great works of nature the analogy of the productions of human contrivance, of human designs, thought, wisdom and intelligence.

The argument from design however is faulty in two respects. In the first place it has the very noticeable defect that the Being of God depends for its proof on the similarity of the divine mind to the human. In the second place it is double-edged, for in arguing from the similarities we must take into account the dissimilarities. It is true that all inferences concerning fact are founded on experience and that all experimental reasonings are founded on the assumption that similar causes prove similar effects and similar effects similar causes, but then it has also to be remembered that these conditions are never realized, as appears abundantly in the history of science.

This brings to light a very formidable difficulty. If we grant this objection to the argument from design in nature would it not apply fatally against the most direct revelation of religious truth it is possible to conceive? Even suppose an articulate voice were heard in the clouds extending at the same instant over all nations and speaking to each man in his own language, even in such a case would not the sceptic argue that all conclusions concerning fact are founded on experience and that the inference from such a fact to a divine reason or intelligence could never overcome the possibil-

ity that this coherent speech proceeded from some accidental whistling of the winds? Thus the argument from the evidences of design in nature can never be conclusive.

Does it not seem then that the only way of escape is to fall back with the mystic on the ineffable nature of the divine essence? This is clearly the tendency of the religious mind when it yields to philosophical reflection. But is mysticism consistent with theism? Is it in the last resort distinguishable from atheism? It is well however that in arguments which concern the foundations of religion the reproach of atheism should be ruled out. The reproach of atheism has been hurled against every system of theism, polytheism or scepticism, insofar as such system has been found to deny the principle of some other system. It is more to the purpose to consider the principle of design itself whether the universe does in fact bear evidence of it. Does not the universe present a greater likeness to animals and vegetables than it does to the productions of human art, and in that case ought we not to think of it as produced by generation rather than by reason and design? Such a vegetative or generative cause would indeed imply design, but it would give no indication of its nature. Why may not, for example, the world have arisen, as the Brahmins say, from an infinite spider, who has spun the whole complicated mass from its bowels and may annihilate afterwards the whole or any part of it, by reabsorbing it and resolving it into its own es-

sence? Were there a planet wholly inhabited by spiders would not the inference seem as natural as to us is the inference to design and intelligence? Is it really necessary, however, to have the hypothesis of design at all? Is not the old Epicurean hypothesis quite consistent? What is to prevent finite matter in infinite time from assuming every possible position or order an infinite number of times? May not the universe at present be just one of these stages preserving a uniformity of appearance in the perpetual flux? It is useless to point to the adjustments in the animal and vegetable organisms, for these adjustments are just the conditions of their existing at all.

The triumph of the sceptical argument is complete. Possibly however this may be because we have been wrong in choosing our ground, in seeking to found the truth of religion on reason when we ought rather to base it on feeling. It is not perhaps the divine wisdom but the divine goodness which is manifested in nature. Taking this ground can we infer from the condition of mankind the moral attributes of God? When we review the sorrow and misery of the world, when we take into account the sadness and hideousness of evil, are we not led by the very mystery of evil to conceive the infinite benevolence of God? The reply is that in this case no philosophical subtleties can avail against the dictates of plain reason and experience. If we can discover the moral attributes of God it is only with the eyes of faith. We

are in fact confronted with a dilemma. Without the human analogy we can form no conception of God and therefore have no religion. On the other hand accepting the human analogy it is impossible to reconcile the evil in the universe with the infinite attributes of God. Is there any way of avoiding this dilemma? Can we, for example, suppose that the author of nature is finitely but not infinitely perfect? If, apart from preconceptions, we ask, Is the world as it appears to us in this life such as we would expect *beforehand* the work of a very powerful, wise and benevolent Deity to be? To answer that it is would be a strange prejudice, whatever grounds we might have for believing such a Deity to exist. The world as we know it can not therefore afford us an inference concerning his existence.

When we reflect on the nature of the evil in the universe there are four circumstances on which it may be said to depend. The first is the employment of pain to excite to action where pleasure alone would be all that is necessary. The second is the conducting of the world by general laws. There may be good reasons why Providence, if it exist, does not intervene, but what is certain is that there are particular ills and Providence does not intervene. The third is the frugality with which powers and faculties are distributed to particular beings. The fourth is the inaccurate workmanship of all the springs and principles of the great machine of nature. We must remember

that we are in a period of thought before the rise of the biological and psychological sciences, and the four circumstances are stated in the form they assumed to the scientific reflection of the eighteenth century. Allowing for this the argument is effective enough. Judging the present world by a human standard it must seem to come short and even to negative the idea of perfect workmanship. "Look round this universe. What an immense profusion of beings, animated and organized, sensible and active! You admire this prodigious variety and fecundity. But inspect a little more narrowly these living existences, the only beings worth regarding. How hostile and destructive to each other! How insufficient all of them for their own happiness! How contemptible or odious to the spectator! The whole presents nothing but the idea of a blind nature, impregnated by a great vivifying principle, and pouring forth from her lap, without discernment or parental care, her maimed and abortive children!"

There are four hypotheses possible concerning the first causes of the universe. The first is that they are endowed with perfect goodness. The second is that they have perfect malice. The third is that there are opposite causes, some with goodness, some with malice. The fourth is that the causes of the universe have neither goodness nor malice. It is impossible to prove the first or the second because mixed phenomena cannot prove unmixed principles. Against the third hypothesis is the

fact of the steadiness and uniformity of general laws. So by far the most probable is the fourth.

There is nothing in this argument or in its conclusion which would shock the sensitiveness of the modern religious consciousness. We have become used to the free discussion of the value and significance of the scientific aspect of the world. It was very different at the end of the eighteenth century. No one could be satisfied with this conclusion, and for Hume it is not the last word. Notwithstanding the freedom of his conversation and his love of singular arguments no one, he now confides to us, has a deeper sense of religion impressed on his mind or pays more profound adoration to the Divine Being, as he discovers himself to reason in the inexplicable contrivance and artifice of nature. We are given an insight into scepticism. The true sceptic finds himself unable to rest satisfied with a pure negation. After all, he reflects, is not human religious experience itself a matter of fact, and some inference in regard to cause arises in every fact. The real concern of the sceptic is to distinguish true religion from vulgar superstition.

Even with this explanation the conclusion of the dialogue is startling:

> Believe me, Cleanthes, the most natural sentiment which a well-disposed mind will feel on this occasion, is a longing desire and expectation that Heaven would be pleased to dissipate, at least alleviate, this profound ignorance,

> by affording some particular revelation to mankind, and making discoveries of the nature, attributes, and operations of the Divine object of our faith. A person, seasoned with a just sense of the imperfections of natural reason, will fly to revealed truth with the greatest avidity: while the haughty Dogmatist, persuaded he can erect a complete system of Theology by the mere help of philosophy, disdains any further aid, and rejects this adventitious instructor. To be a philosophical sceptic, is in a man of letters, the first and most essential step toward being a sound, believing Christian.

Is this irony? Is the great sceptic mocking us? It seems impossible to imagine it can be anything but Mephistophelean humor. He cannot, we think, be serious. In my own view it may be irony, but it is none the less serious. What all the commentators seem to me to have failed to notice is that there is nothing in the least inconsistent with the argument in the conclusion, and that it is in thorough keeping with the whole tenor of Hume's philosophy. And more particularly it simply repeats the conclusion of the famous essay on "Miracles," which conclusion in its turn has always been dismissed as an example of irony.

Hume's thought in both instances is plain and straightforward. I will state my interpretation of it in my own words. Revelation cannot possibly be based upon or supported by natural religion, because revelation if it is fact

must depend on evidence of a totally different kind. It rests not on the force of reasoning but on the evidence of testimony, on the testimony of those who have received the revelation by miraculous signs, that is, by witnessing phenomena contrary to the order of nature. Hume's great argument is that such evidence weakens proportionately with the distance in time from the event and with the number of independent transmitters of the tradition. It follows from this that if we are able to believe their testimony we are actually believing against nature, and such faith is itself a miracle. Everyone who believes the Christian religion and reflects on the nature of his belief knows that it is not the same kind of belief as that which follows from sense experience, as when for example he believes the sun will rise tomorrow. The belief may be rational enough, but his faith is against the natural order and not founded on it, and this, Hume claims, is consistent with the Christian theory itself.

It seems difficult to believe that a sceptic so radical as Hume could offer a serious apology for the Christian faith, and I do not put forward this argument as evidence that he himself subscribed to any of the religious creeds of his time. It is important however to reckon with the sincerity and earnestness of his exposure of the philosophical dilemma in regard to revelation. It must rest on human testimony, and human testimony can never acquire the force of direct experience. We may see therefore in

the sceptical refutation of natural religion the fundamental affirmation of freedom.

This particular work of the great eighteenth-century philosopher which I have submitted to this detailed examination deserves special study by the student of the history of ideas, for while it sums up in a masterly way the philosophical position of its time it looks forward with almost conscious clairvoyance to the new presentment of the problem which will give its character to the philosophy of the nineteenth century. We may see in it almost a prophetic anticipation of that complete divorce of science and religion which will distinguish the new materialism.

IV

Mechanism and Scientific Materialism

The nineteenth century has hardly yet receded into true historical perspective. Many of this generation have been contemporary with its chief actors. It stands before us however as the century of scientific achievement. It witnessed an acceleration of scientific discovery and a practical application of scientific invention more marvelous than any transformation which history has recorded. What we are now to consider is the new aspect of the freewill problem which the scientific advance has brought with it. The predominant intellectual attitude toward all spiritual values during the great period of scientific expansion and progress was one of blank negation. The religion of the nineteenth century found itself more and more estranged from, more and more repelled by, more and more irreconcilable with, science. Freewill is rejected as pure illusion. The characteristic mark of science is mathematical necessity.

It is very interesting to follow the growth and development of this mechanistic and materialistic conception of reality. It would be a complete mistake to regard it as in any way

parochial, as concerning only a coterie of obtrusive militant leaders of a band who adopted for themselves the banner of science and named themselves scientists. The scientific spirit is stamped on the thought of the time. In the middle of last century, philosophy, in the meaning which we give to it today, in the meaning which it has kept through the modern period, was at its nadir. It was tolerated as an accessory to the sciences; it was even honored so long as it kept a subsidiary place and acknowledged itself dependent on the sciences for its subject matter and accepted as its peculiar task the classification of science and the ordering of the sciences on a kind of hierarchical principle. Religion found its domain more and more invaded by science, till at last there was not only separation but open conflict and hostility. The early struggle of science for free expression against the authority of the church, which produced in the fifteenth and sixteenth centuries the strange phenomenon of martyrs for an ideal which held forth no vision of palm branch and crown to its votaries, was turned into a new authority of reason, rejecting all forms of religion as degrading superstition. Philosophy became methodology, taking the term in a narrow meaning as the interpretation and establishing of the method of science. Its success was judged by the degree in which it could rationalize and invest with authority the principle of scientific induction. Hardly anything else could be said to matter; the only

truth there was to know was scientific truth. The representative philosopher of the nineteenth century is Herbert Spencer, and when on one occasion one of the English enterprising newspapers enlisted the opinions of eminent men on the best hundred books in literature, and Herbert Spencer was appealed to, he made the characteristic answer that he knew and cared nothing about literature, that such time as he had to spare from his special work of generalizing the results of science was given to reading scientific works. As a philosopher he set for himself the preëminent task of bringing into unity the results of special investigations in science by those engaged in research. His ideal was strangely reminiscent of Bacon in the *New Atlantis,* the Utopia which was organized for scientific research by team work under philosophical theorizing directors. Herbert Spencer did, it is true, recognize a realm in which religious truth might be sought for, for he could not ignore the popular interest in religion, but it was not an attractive prospect nor a promising venture. It was the realm of the unknowable, open he thought to unrestricted speculation but shut out from the clear illumination which penetrates the realm of the knowable, the sphere of physical science.

The background of the intellectual horizon in the middle period of the nineteenth century is the dominating concept represented by the nebular hypothesis. This was the hypothesis that the universe, or at least the partially shut-

off portion of it, which alone interests us, and which we name the solar system, existed originally in a state of wide dispersion of free-moving, constituent elements subject to fixed and absolute, mechanical laws. The behavior of such a mass of material could be easily worked out, for it was legitimate to assume that the same laws hold and the same principles apply to worlds in space as to the partial systems we can isolate artificially and control in the laboratory. The telescope reveals such nebulae in the stellar extension of space and they were interpreted to be actually worlds in the making. From the hypothesis however this inevitable consequence seemed to follow, that whatever disposition we find now in the present actuality of the universe must have had its condition in the nebula in which it was potentially present. For since the world in fact is the outcome of the nebular condensation its present state is wholly the result of the internal play of forces acting, reacting and interacting; its condition therefore at any moment is absolutely predetermined. If anyone possessed the power to calculate the forces at work he would be able to read in any state any other state, he might see in the original nebula any subsequent state of the universe at any required moment down to its minutest details. Unlike the somewhat similar idea of Leibniz of the omniscience of God as a factor in the establishment of the general harmony of the creation, the nineteenth-century thinkers had no need

for the existence of an omniscient being; it was enough for them to affirm the theoretical possibility of such knowledge, for the fact in no way was dependent on a mind conscious of the fact.

It is impossible to exaggerate the influence of this dominating idea on the mind of the age. Of course it met with opposition. Men like Carlyle, Ruskin and Emerson denounced in scathing terms the materialistic trend of the age, and endeavored with all their literary, artistic and philosophical power to restore the lost vision and to alter the general direction of thought and life, but the silent, onward advance of science, from triumph to triumph, deepened the conviction that aesthetic, moral and religious values had no substantial support in reality. Like every phenomenal existence they required explanation and interpretation, their place must be assigned to them, but it seemed they could be no more than illusive subjective appearances, a kind of sunset glow with no existence and no meaning apart from the expression of the beholder's mood.

The vitality of religion was also at this time at its lowest ebb. The only independent stirring of religious thought was expended in the abortive, and as it now appears to us the ridiculous, expenditure of energy on the Oxford Tractarian movement. At the very time when science was discovering new worlds to enter every day, and securing an ever firmer hold on the imagination of the age, the leaders of re-

ligious thought were exercised over the problem of apostolic succession and the validity of orders, with the sole result of bringing about the secession of three of their foremost intellectual leaders from the Anglican to the Roman communion.

As a result the triumphant march of science is accompanied by a deep depression of the human spirit. It is most marked in the two representative poets of the Victorian age, Tennyson and Browning. It speaks out alike in the despair of the one

> For what am I?
> An infant crying in the night
> An infant crying for a light,
> And with no language but a cry.

and in the cheerful faith of the other,

> God's in his heaven
> All's right with the world.

It is also very noticeable in the one leader who truly represented the philosophical tradition in England throughout that period, John Stuart Mill, of whom I shall have more to say directly. A melancholy which is negative rather than positive, which is marked by the absence of joy rather than by the presence of sadness, gives a peculiar tone to all the writings of that great philosopher. He tells us in his *Autobiography* of the depression which he suffered from the reflection that the possible combinations of musical notes is limited and therefore that

the range of melody is strictly finite—a curious consciousness of the one dominant note of the new spirit, the reign of necessity.

This aspect of the freewill problem, in which freedom is rejected as an unscientific concept and as pure subjective illusion, characterizes only the middle period of the century. There is not even the foreshadowing of it when the century opens and it has practically departed when the century closes. It is this which makes the intellectual development of the period of more than usual interest.

The eighteenth century had ended with the great catacylsm of the French Revolution, and the new century opens with the Napoleonic wars affecting the whole Western world and bringing in the world-wide reaction from the idealism of the emancipators. This reaction did not however take the form of a materialism; on the contrary it was a new romanticism.

The first quarter of the century saw the development of the greatest idealistic constructive thought in the history of philosophy in the modern period, the German post-Kantian idealism, which culminated in the work of Hegel. When Hegel died in 1831, a victim of cholera, in the sixty-second year of his age, he was in the midst of his work and at the height of his personal influence. That influence however was confined to the university circles of Germany. Indirectly the spirit of the whole movement which developed from the Kantian philosophy was introduced to England, mainly

however through the poets Goethe, Schiller, and Lessing and their English contemporaries, Wordsworth and Coleridge. The significant thing in the Hegelian philosophy is that it is the first metaphysical system into which the idea of evolution enters as a fundamental principle. It is true of course that it is a quite different conception of evolution from that which came to dominate the thought of the great scientific researchers, yet it was Hegel's concept of evolution which probably more than anything else inspired the new interest which brought about the revival of his philosophy in the last quarter of the century. This revival so far as our Anglo-Saxon development of the philosophy is concerned was inaugurated by J. Hutchison Stirling, a Scottish professor, whose *Secret of Hegel,* 1865, started the new interest; by William T. Harris, who besides translating considerable portions of the *Logis* edited the *Journal of Speculative Philosophy* in New York; and by the Oxford professors and scholars, Thomas Hill Green and William Wallace, and later F. H. Bradley and Bernard Bosanquet, who have but recently passed from us.

The Hegelian system of absolute idealism was the logical and metaphysical development of Kant's theory of knowledge. The principle of Kant's philosophy was that, while the material or content of knowledge comes to us from the world of outer and inner experience, the form of knowledge is imposed by the mind itself. The wonderful order of nature which

strikes us with admiration is the work of the mind itself reflected back to it. The logical categories or universal predicates which we assign to all objects of knowledge—quantity, quality, substance, cause, etc.—are the mental frames into which the mind receives its data; space and time are the forms under which it ranges in order its perceptions; and consequently the laws of nature are not an order which we find in nature but an order which we bring to nature. The Hegelian principle is that these categories of thought are not rigid frames with which the mind is provided and into which somehow it fits the chaotic, alien material supplied to it, but moments or stages of an active process which creates the actuality. In the ordinary activity which we distinguish as thinking, of which formal logic is the authoritative science, we may recognize a real agency at work, howbeit moving only in the abstract realm of representation. This logical process, or thinking, is the dynamic principle of reality, the force which creates the world, and we can by watching its movement discover its principle and recover the rhythm of its advance. It is not as ordinary common sense represents it, a continuous discovery; it is dialectic. It moves like a discourse through and by means of opposition, from affirmation to negation, and from negation to affirmation, ever advancing to higher concreteness. We have accordingly in the Hegelian conception the direct reverse of the ordinary notion. Instead of

things provoking thoughts, the whole reality of things is created by thought. "There is nothing either good or bad but thinking makes it so." The very objectivity of nature finds its ground in the negativity it opposes to thought. The absoluteness of the negativity constitutes the obstinacy of the objectivity. The real world is not abstract thought, nor inert materiality, but Mind, the concrete world of Art, Religion and Philosophy.

It is perhaps unfortunate that Hegel from the very beginning of his philosophical career took up a critical and hostile attitude toward Newton's *Principia,* the recognized ground and authority of physical science. He satirized unsparingly the English conception of natural philosophy and he attacked Newton almost savagely. The Latin dissertation which Hegel presented to the University of Jena for his doctorate in 1801, four years before his first philosophical work, the *Phenomenology of Mind,* was published, is entitled *De Orbitis Planetarum.* It is an attack on Newton, charging him with confusing mathematics and physics, with substituting the laws of forces for the laws of phenomena, describes him as treating concepts as though they were sticks or stones, and makes the often quoted jest on the apple story, that three times had that fruit proved fatal to our race—first, in the garden of Eden in the universal ruin it had brought on mankind; second, in the destruction which had overwhelmed Troy; and now, in the evil fate which had over-

taken the principles of natural philosophy. To the end of his life Hegel was unsparing in his denunciation of the natural philosophy which was represented in the work of Newton. Now although we know today that the weakness of Newton's physics was due to his disregard of metaphysical difficulties and his impatience with such obstruction to his work as they seemed to offer, yet it was no time to attack the experimental method, and Newton's experiments in particular, in the interest of a speculative method, when science was daily proclaiming new triumphs and mankind was beginning to realize the vast possibilities of its extension.

Before we leave this consideration of the Hegelian philosophy to take note of the new ideas which were actually forming the mind of the nineteenth century let us pause a moment to realize the nature of this latent and repressed force. Here in the beginning of the great scientific expansion is the strongest expression ever formulated in philosophy of the consciousness of the power and creative activity of thought. It is not an idle speculation, it is not an extravagant hypothesis, it is a natural system, based upon reason, dependent on reason, appealing to reason, trusting wholly to the direction of reason. Every kind of criticism has been directed to it, yet no one has ever succeeded in impugning its rationality. It is rejected as incredible, not on account of any missing link or essential weakness in its argument, but because when

viewed as a whole it seems to make a claim for reason itself which so far exceeds our human modest estimate of its powers that it outrages our sense of proportion. What more feeble and disproportionate than our thinking when opposed to actuality! What more seemingly ridiculous and absurd than to imagine this actuality as its outcome! True, it is not our individual thinking, yet even universal thinking is no more than the accumulated thinking of individuals. Multiplying noughts will not advance us one step beyond the original zero.

The issue was never joined. Hegelianism disappeared before a new doctrine which was proclaimed with the ardor of a new religion, which indeed soon essayed to set up a new religion with its calendar of saints and its sacramental sanctions and its priesthood. This was positivism. Its founder was Auguste Comte. I shall not deal with the religious development, which however interesting is unimportant, but only with the philosophy of it which is important. In a sense it was an evolution theory, though restricted in its scope to the working of the human mind in its attempt to interpret experience. It was announced as a new discovery, illuminating the whole history of philosophy, and offering at last the promise of real attainment of the goal of all philosophic endeavor. It was the law of the three stages. Man, it said, in his search for the hidden causes of natural phenomena, first attributes them to personal agencies, to beings modeled on the

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type of his own activity, endowed by his imagination with the necessary transcendent powers. This is the theological stage. In it the unseen world is peopled with imaginary personal beings possessed of intellect and will, animated by malice or by goodwill, rational or capricious, according as the circumstances to be explained seem to require. When this interpretation fails, as it inevitably must, man then replaces the spiritual and personal agencies with abstractions formed by reflecting the circumstances themselves into an etherealized reality or shadow form, which is then taken to be the unseen ground of their existence. This is the metaphysical stage. First entities, forces, essences, quiddities, with magical and occult virtues; then later concepts, ideas, pure forms, universals *et hoc genus omne,* take the place of the gods. When in the course of its natural development the futility of this procedure is brought home to the thinker, then man is ready to enter on the third or positive stage. This is not, like the others, the adoption of a device; it does not add another to the vain attempts to penetrate the veil which phenomena seem to interpose between the mind and the inner source or reality. It is the illumination which comes when the vanity of such attempts is realized. It is the deliberate resolution to abandon devices, to accept phenomena at their face value, to be content with the positive facts presented in experience, and without going behind them to interpret them, studying

them with the purpose first of classifying them, secondly of introducing an orderly arrangement into the classifications, lastly of inferring from them natural affinities and relations and laws. Comte had not failed to profit by his study of the history of philosophy. He did not propose a return to common sense or anything resembling what some philosophers are advocating today under the terms "naïve realism" and "animal faith." He was not going to be pulled up with the scepticism of Hume or upset by the antinomies of Kant. The facts which positivism would accept were frankly admitted to be phenomena, they claimed no independent status; but the method of positivism was not to speculate about things in themselves, it was scientific order, classification, generalization. The work of the philosopher was in a sense synoptic, for it was surveying the whole extent of experience with a view to the determination of a hierarchical order. With this principle he himself set to work and in the years 1830 to 1842 he produced the six volumes of his *Cours de Philosophie Positive*. His object was to exhibit the sciences as branching from a single trunk, from mathematics at the bottom to sociology at the top. The only point to which I wish to draw special attention is to show how in this work we may see that Comte is under the influence of that dominating idea of the nineteenth-century thinkers that historical development reveals a natural evolution from simple conditions and comparative indifference

to ever increasing complexity, from the simple condition of the primitive nebula to the exhaustless variety of the modern world. Mathematics is at the bottom of the scale, not because of its comprehensiveness, but because as Comte conceived the science its principles are simple and self-evident. This actual part of Comte's philosophy, though it greatly impressed the philosophical world at the time, had no lasting value. It fell naturally into complete neglect. On the other hand the ideal of positive science which Comte had proclaimed had a determining influence on the general direction of thought.

The synthetic philosophy of Herbert Spencer, the prospectus of which was sent out in 1860 and the tenth and final volume of which was completed in 1896, challenges comparison with the *Cours de Philosophie Positive,* although it is in fact a quite different conception. There is in truth very little in common between Auguste Comte and Herbert Spencer, and yet but for Comte it is improbable that Spencer would have occupied as he did the foremost position and have come to be regarded as the typical nineteenth-century philosopher. It was because he seemed to realize that emancipation from theology and metaphysics which Comte had proclaimed and because besides he seemed to express the whole spirit of the new confidence in science that he became the new leader. To Spencer belongs the credit of having made the idea of evolution explicit.

No one can understand the extraordinary and sensational effect of Darwin's evolution hypothesis in his *Origin of Species* and the various works which followed it who has failed to appreciate the extent to which the general idea of evolution had stamped itself on reflective thought in the early part of the nineteenth century. We are accustomed to think of Darwin as the originator of the theory of evolution. The fierce controversy which immediately followed the publication of his book in 1859 and continued to rage around it, a controversy strangely resurrected in our own time, makes it stand out as the landmark of the century. It tends however to make us lose sight of its true significance in the historical development of ideas.

In Herbert Spencer's original conception of a philosophy of evolution which would be a synthetic reconstruction of the world process, there is no consciousness of the particular problem of the origin of species or of the descent of man from inferior forms of animal life, which led to the concentrated researches of Darwin. Indeed even in Spencer's later work he shows distinct impatience with it. It is characteristic of his whole attitude toward his task that he could never see anything of vital importance for his conception in the crucial biological problem of the inheritance of acquired characteristics. Whatever might be the result of experimental research, he was content to decide the question *a priori*. His whole con-

ception of evolution required that acquired characters should be heritable, therefore they must be transmissible. He felt no need of a proof of a logically sound inference. In the same spirit, though with more apparent consistency, he refused to bother himself with Kant's philosophical theories. He tells us that he began to read Kant's *Kritik* but when he found that Kant's doctrine of space and time shocked his common sense he took no trouble to read any more. Indeed it would appear from his *Autobiography* that he could never have read any book through. He consulted scientific treatises for the particular matter he had in hand, as one uses a reference library. He had no original ideas at all, and yet perhaps in the whole line of philosophical thinkers there is no one so original, certainly there has never been one more confident in his own intellectual powers.

What did Herbert Spencer mean by evolution? Much more what we mean by development than what is implied for us in the word evolution. His idea seems to have been that the cosmos resembled a plant or an animal, not in the possession of any vital principle requiring further definition, but in the fact that it begins with an apparent simplicity and undifferentiated selfsameness and then under favorable conditions breaks out into rich diversity, always however under the guidance of mechanical laws, which seem mysterious when we have regard to the ultimate complexity but are

transparently simple in their first working. What the philosopher has to do is to disintegrate the finished product and with the classified pieces reconstruct the process.

It is curious as we look back on that time to reflect how easily a doctrine which to us seems so superficial that we wonder how it could ever have been imposed on anyone, let alone have satisfied a serious inquirer, could appear to a whole generation as the concentrated wisdom of the ages. We shall never understand this unless we penetrate below the surface to the underlying conceptions. It is then we see that the profound conviction in the minds of that generation is that the basis of reality is materialistic and the process of existence mechanistic. When we understand this we see how necessarily the whole intellectual effort is strained on the attempt to rationalize this deep-seated conviction. As Herbert Spencer presented this conception in his *First Principles* he is well aware of the difficulties involved in it and which appear even in its statement. They are the old difficulties which in the past have produced the theologies and the metaphysics from which we are at last to be emancipated. We cannot, it is true, even now help asking the questions. What are matter and motion? Who was the first mover? But at least we can know that we can have no answers. And the reason we cannot answer is, and this is Spencer's new doctrine, not because as yet we do not possess the information but because these origins are in

the nature of the case unknowable. Only when we are content to recognize the limits, not of knowledge but of knowability, can we with any prospect of success enter into possession of our proper realm, the knowable. Here then is the great distinction; theology and metaphysics are false knowledge, for they concern objects which indeed we may suppose to exist or even believe to exist but which in their very conception are unknowable. Science on the other hand deals with all that is knowable, however imperfectly known. Against the background which this distinction furnishes him Spencer formulates his principles: first, general principles which apply to all the knowable; and second, particular principles whose application is within the sphere of each class of sciences or of each science in the class. The general principle is that of evolution and dissolution: An entire history of anything must include its appearance out of the imperceptible and its disappearance into the imperceptible. The often quoted definition of evolution is adopted from Von Baer. "Evolution is an integration of matter and a concomitant dissipation of motion; during which the matter passes from an indefinite incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation."

Before I leave the consideration of Herbert Spencer's philosophy I would like to add a personal remark for what it is worth. I myself

lived through the enthusiasm which it inspired and yet never felt the grip of it. I well remember the eagerness of a friend who like myself read the *Data of Ethics* as soon as it appeared in 1879. To him it was the illumination of a lifetime. To me the main impression it left was blank disappointment. If that is all, I reflected, is it worth saying? Ethics to me is the problem of freewill, and if there is no such thing as freedom there is nothing for ethics to deal with. Spencer had only biological principles to go to for ethical principles. The good is conduct conducive to life. This definition at once landed him in a difficulty, for there is nothing in life itself which constitutes it an object of desire. Whether life is desirable or not must depend, he thought, on whether the pleasures it held showed a clear balance over the pains. Before therefore one can determine the criterion of good conduct one must first consider and decide the question, Is life worth living? Suppose this decided, how then are we to decide between the immediate pleasure aimed at in egoistic action and the more remote pleasure implied in altruistic action? His only suggestion is that a man must compromise. Such is all it amounts to. Yet we find the most varied estimates of the value of Spencer's ethical theories, some thinking them the only part of his philosophy likely to live, others rejecting them as a mass of logical inconsistencies and illogical assumptions.

We can now see why the Darwinian hypoth-

esis was received by the world of science as a triumph and why it became the standard under which the march of science was to go forward. The fundamentalists today are not wrong in singling out the Darwinian theory as the critical parting of the ways between modern science and the old religion. Where they are short-sighted and foolish is in imagining that the old battle can be fought out over again on the old battle-ground and under the old conditions.

The new thing in Darwin's scientific hypothesis was not the doctrine of evolution, but the formulation of a theory which would explain biological evolution on a purely mechanistic basis, without calling in aid purpose, design, final cause or Providence in any form whatever. All evolution theories up to Darwin had introduced the idea of the effectiveness of personal striving, of individual effort in some form; and in the case of all acquired characters and devices in which consciousness was not a factor, as in vegetable life and in the instinctive forms of animal life, it seemed impossible to conceive evolution except on the assumption of transcendent mental agency. Lamarck's theory, which appealed widely to the students of what then was termed natural history, was no more than a scientific speculation. Darwin's theory on the other hand was a hypothesis which vindicated completely a scientific principle, a principle which in regard to the phenomena of life and mind could say, as Laplace had said in re-

gard to the phenomena of the celestial firmament, that God is a hypothesis for which we have no need. Darwin's theory was that the progressive development of living individual forms to a higher efficiency was brought about by a natural selection which resulted in the survival of the fittest in the struggle for life. The idea occurred to him by considering the way in which varieties of domesticated animals are produced by artificial selection. It led him to think that a selection of the same kind might be going on in nature on a universal scale and working automatically. This led to the theory that new species are continually arising by natural selection of the fittest to survive in the struggle for existence. The argument was direct and simple. Throughout the living world continuity depends on individual reproduction. To maintain itself a species must reproduce more individuals than the new generation will sustain, it must produce a sufficient excess to allow for accidents and the shifting changes of the environment. Also the number of individuals must have regard to the food supply and in many cases must be far in excess of it. There is therefore throughout the living world and within every living species a struggle for survival, not an internecine strife, but an internal rivalry in which every chance advantage will tell in favor of the possessor. This must have the effect that where conditions change, or where pressure comes from within, there occurs a natural selection, so that in the long run the

best fitted to survive live to propagate the new generation. Given the necessary time this natural selection would suffice to account for all the variety of living species from the first origin of life to its last living expression in man.

Although it was the publication of Darwin's book, *The Origin of Species,* which drew immediate attention to the theory and associated it with Darwin's name, the theory was in fact the joint work of Darwin and A. R. Wallace. In 1858, a year before Darwin published his book, the theory had been communicated to the Linnaean Society of London in a paper under their two names, and in which they had collaborated. Wallace had been particularly impressed with the application of Malthus's population theory to the problem of the origin of species. As soon as the new evolution theory began to be discussed everything seemed to converge on its confirmation. Scientific opposition there was none, and in its absence the enmity of those who were unwilling to modify the old beliefs naturally came to be denounced as prejudice and obscurantism.

Our present interest however is to see what was the real effect of the new theory and what were the inherent defects which have led to its modification. There are no biologists today who do not rank the Darwinian hypothesis as the first essential in the establishment of the modern science of biology, and there are very few who would subscribe today to the theory as

Darwin held it. What has brought about the change?

The early evolutionists confined their attention to the problem of structural evolution and treated function as the simple concomitant of structural complexity. The problem of life and mind lay completely outside their research. They might hope indeed to throw light on it by their researches, but so far as Darwin himself and his followers and immediate successors were concerned, while they recognized the problem of the origin of life and the peculiar difficulty presented by the nature of consciousness, they purposely set these problems aside as having no necessary connection with the matter of their research. Their whole attention was directed to organic transformism and structural adaptation. Life and mind were functional, not structural, and no one seemed able to question the principle, which with the scientific bias toward mechanism and materialism seemed self-evident, that structure is the basis of function. Apart from material organization there is no life, and apart from life no mind; and from this the inference was drawn that substantively and dynamically they can be no more than phenomena of material organization. Accordingly we find George Henry Lewes, one of the most distinguished of the intellectual leaders of that period, in his *Problems of Life and Mind,* putting forward the view that mental and spiritual phenomena are simply an aspect of material organization, and some decades

later T. H. Huxley coined the word "epiphenomenon" to express his idea that consciousness is a one-sided phenomenon, a by-product or concomitant of organization, an effect possessing in itself no efficiency. The purely biological development of the evolution theory tended to emphasize still more the mechanistic nature of the principle. The first subject of intensive inquiry and experimental research concerned the question of the transmissibility of acquired characters. This seemed to be definitely decided in the negative when Weissmann was able to distinguish in the embryo the germ plasm from the somatic plasm and to demonstrate what he claimed to be the continuity of the germ plasm. This threw the natural selection a stage back and eliminated from the process any advantage from individual striving or achievement, for the effective selection was not the selection of individuals to survive, but of the germs which were the potential individuals.

With this new and growing interest in the biological sciences there had been continual expansion and progression in the physical sciences. In particular the spectroscope had opened out to the investigator an entirely new realm for research. The stars which even Auguste Comte had proclaimed pontifically to be outside the orbit of the positive sciences were yielding the secret of their constituent elements, and these were discovered to be identical with the elements the chemists were

isolating in terrestrial laboratories. The whole cosmos appeared to have been extraordinarily simplified. All animistic concepts had been successfully exorcised. At last science might consider it had reached bedrock. Much work remained to be done, work which promised to engage the industry of many generations yet to come, but the pioneers had fulfilled their promise; the principles on which the work would now go forward and the general foundations of the physical universe were established on an incontrovertible basis.

It is curious to reflect on the way in which history which is always novel seems at times to repeat itself. We have seen how in the seventeenth century the mechanistic system of Descartes seemed to satisfy completely the accepted criterion of truth, the clearness and self-evidence of the ideas, until Leibniz pointed out that it had not and in its nature could not interpret the living organic world, and that this could be remedied only by a re-formation of the concept of substance on which the system rested. So no sooner had the nineteenth-century philosophers settled to their satisfaction the materialistic basis of the universe, and the mechanistic principle of its process, than it was found that the active principle of the process itself and the continuity of its history in the evolution of living forms, and the observing mind with its accumulation of past experience, were not merely left outside but could only be

brought in by revising the whole scheme and reconstructing the entire fabric. Again has been illustrated the old saying, "The stone which the builders rejected is become the head of the corner."

Can we say what it was in this materialistic conception of nature with its mechanistic principle, which, notwithstanding its apparent strength, made it unstable and insecure. I think we can. It had its Achilles heel. This was its psychological theory. The fatal flaw in its system is the assumption that the constituents of conscious experience—feelings, thoughts, ideas, desires, volitions—are not real but only ideal existents, and that the ideal has no true substantiality and no effective causality. The psychology of the positivist and utilitarian philosophers of last century, of Lewes, Spencer, John Stuart Mill and Alexander Bain, was taken over from the eighteenth-century philosophers, Locke, Berkeley, Hume, Condillac, Helvetius, and fitted on to the positive sciences of the nineteenth century. These positive sciences were a closed circle and when psychology sought admission there was no place for it. Its claim could not be ignored and there was no way in which it could be admitted. There was only one alternative, to treat it as a parallel science outside the group of physical, physiological and sociological sciences, an ideal order existing side by side with a real order, a science of a kind, having no effective insertion in reality yet exhibiting an order of its own. This

was the associationist theory. Our psychical existence consists of a stream of subjective sensations variously classified as images, ideas, emotions, feelings, desires, volitions, all derived individually by external impressions on sensitized organisms, but linked together by association. Of this association there are laws. In this theory there was nothing new. The laws of association—the law of similarity and the law of contiguity—were as old as Aristotle. The main emphasis, however, was now on the distinction between laws of association which are purely ideal and causal laws which are real. This might satisfy the scientific conscience, but it was a weak bulwark against the philosophic attack. From the standpoint of philosophy the most significant if not the most spectacular event of the last decades of the nineteenth century was the complete failure of the associationist psychology to withstand the criticism of the new Hegelianism.

The nineteenth century ended with more than a reaction against materialism; it closed with a scientific revolution. The change has been sudden and dramatic. Within the lifetime of this generation a complete reversal has taken place of all the fundamental concepts, and of all the principles which were accepted as axiomatic by the great pioneers of the scientific work of that century. The revolution has not come by assault from without, but by illumination from within. We are living today through one of the very few great epochal

crises in the history of human thought. To find an analogy we must go back to Athens in the fourth century B.C., or to Europe in the sixteenth century. What is absolutely unique in the supersession of ideas which is taking place in our time is the immediate and unqualified acceptance by philosophers of the new principles. In 1895 the electron theory was formulated. It completely changed the aspect of the physical world. Until then it had been accepted in physics and chemistry that the material universe consists of atomic elements qualitatively different and no further reducible. Some seventy were known and described. They were ultimate and by their combination was brought about the variety of nature. The older idea that elements could be transmuted, which for centuries had possessed the thought and imagination of the alchemists and astrologers, was universally regarded as dark-age superstition. Unexpectedly a new hypothesis of the electrical construction of matter was put forward, worked out by the mathematicians and physicists, tested and verified, and as a consequence the whole science of physics which had seemed so securely established was antiquated. Today we have detected ninety-two atomic constituents of our terrestrial mass, but these differ from one another only quantitatively and constructively, being all resolvable into identical constituent electrons and protons differing from one another only in the opposite signs, positive

and negative, of their single electric charges. Ten years later, in 1905, the principle of relativity was formulated. This meant that space and time which since Newton had been referred to as an absolute framework of masses and movements and accelerations were themselves relative to the observer's system of reference. In 1917 the general principle of relativity upset the Newtonian law of gravitation, disproved the idea of attractive force, and worked out a new law of gravitation on the principle that the geometry of space determines the direction of moving masses. At the same time it became clear that the new principle must alter radically the whole conception of laws of nature. The whole background of scientific research is now changed. It would be simply unrecognizable to those who lived before it, and unintelligible to those who have not lived through it. Physics today is a new physics in the most absolute meaning of the term. With this change in the background of physics has come a parallel and corresponding change in the background of what by contrast we might call psychics. This change has also come within our generation, but its aspect is less dramatic. Modern psychology is a new science. Its status is not yet fixed and most contradictory theories are held concerning its nature and principle. Nevertheless, despite the extent of disagreement as to its position, the new psychology is recognized as a science with a concrete subject matter.

Before I leave the historical retrospect and put forward a constructive theory of freedom, let me try and give an idea of the world problem as it weighed on the mind of those who felt to the full the enthusiasm of the new scientific era and rejoiced at the emancipation from the old superstition.

We have a document of inestimable value in that extraordinarily interesting book, the *Autobiography* of John Stuart Mill. It contains a chapter in which he describes his father's character and opinions. In this he is, as we easily discover, setting forth his own world view and his own attitude toward the problem of life and reality. That is to say, in the character sketch of the father we are reading the philosophical mood of the son. There is a special reason in this case, for the son had and knew no other preceptor but his father. John Stuart Mill died in 1873 (he was born in 1806) and his *Autobiography* was published posthumously in the same year. It is therefore a reflection of the mind of that age in its outlook on the problem of humanity. His education was quite unique. He never went to school or college. He was instructed entirely from infancy by his father personally, who made it his object to inculcate in him the habit of self-education. So what happened to him could not possibly have happened to an ordinary student at an institution like a public school or university, namely, he grew up without religious belief of any kind or interest in any polemical aspect of the religious

life of his age, able when he entered into the general relationship of life to regard the beliefs of his fellow men with the same complete detachment as most of us experience in regard to the old pagan creeds when we read ancient literature. It is a singular phenomenon but also a peculiarly instructive one, for we see an actual case of the experience of the father carried along and continued in the character of the son.

James Mill, the father, had been in his youth a Scotch Presbyterian, and his faith in Christianity had been at first fortified, then destroyed, by the argument of Butler's *Analogy*, affording therefore a singular instance of the danger of two-edged weapons. Butler's famous argument was that all the objections urged by infidels against Christianity tell equally against natural religion, and therefore anyone who can be a deist can have no intellectual difficulty in accepting Christianity. Let us not forget that Butler's *Analogy* was a powerful and effective argument in an age when as yet there was no historical criticism, in the intensive meaning which we have learned to recognize, and that like all moderate statements it had a very wide influence. The unfortunate part of the argument is that its very effectiveness turned it against the natural religion which it took to be self-evident, and then the only alternative to a belief in a supernatural revelation was seen to be atheism. Atheism however is as objectionable in its negation and as dogmatic as the

most authoritative religion, and therefore has never attracted the sceptical philosopher. The nineteenth century took refuge in agnosticism. What is however of the deepest interest in the case of John Stuart Mill is that his father's and consequently his own rejection of religion were not on intellectual but on moral grounds. This also is characteristic of the mental attitude of the nineteenth century. One very noteworthy consequence of it we are experiencing today. Two articles of the Christian belief which were universally accepted in the middle of the last century have been dropped out of the Christian doctrine which is preached today—the doctrine of everlasting punishment, and the belief in the personality of Satan as the omnipresent tempter. Both these doctrines were, up to a very recent time, universally accepted as an integral and authoritative part of the Christian religion. They have not yielded to attack, they have been dropped for lack of defenders. The reason is not that they are logically assailable but that they are morally indefensible. Both doctrines are still nominally part of the Christian creed, one of them a very essential part of one of the regularly recited creeds, and yet no one today would be excluded from any of the liberal Christian communions for refusing to subscribe to them.

We have then in John Stuart Mill a typical nineteenth-century mind, able to represent his age so effectively because he had not had like his contemporaries to throw off religious belief;

he never had it, and yet he had been trained under the most exacting moral influences. He is never under the temptation to say "Let us eat and drink for tomorrow we die," a temptation which in some form assails everyone who experiences the blank which is left when cherished beliefs are lost.

Let us now consider the crisis in his mental life which he tells us he experienced when twenty years old and which endured for many months. I will give the important description of this crisis in a quotation.

> It was in the autumn of 1826. I was in a dull state of nerves, such as everybody is occasionally liable to; unsusceptible to enjoyment or pleasurable excitement; one of those moods when what is pleasure at other times, becomes insipid or indifferent; the state, I should think, in which converts to Methodism usually are, when smitten by their first "conviction of sin." In this frame of mind, it occurred to me to put the question directly to myself: "Suppose that all your objects in life were realized; that all the changes in institutions and opinions which you are looking forward to, could be completely effected at this very instant: would this be a great joy and happiness to you?" And an irrepressible self-consciousness distinctly answered, "No!" At this my heart sank within me: the whole foundation on which my life was constructed fell down.

What did this mean? The story of his life leaves us in no doubt. He is known to us as a

philosophical radical, a utilitarian moralist, a great logician and political economist. These aspects of his life and the works which have secured his fame reveal him only as chiefly engaged in what Carlyle described as dry-as-dust research and satirized as pig-philosophy, what Ruskin scorned as the dismal science. His self-revelation in the *Autobiography* is very different. He tells us how he loved country scenes, how they made his childhood happy, how he delighted in the discovery of Wordsworth, reveling in his poems and absolutely sympathizing in his moods, what joy all poetry gave him and especially how sensitive he was to the beauty and charm of music. Here then was the tragedy. All the things he cared for, all the worthwhileness of living lay for him in those values, æsthetic, emotional and religious, which cold philosophy told him were unsubstantial and unreal. The real world was the world of mathematical relations, of unfeeling matter, of stern economic laws, a world without beauty or loveliness, a world in which realized happiness was no more than satisfied desire. Let us hear him again in his own words.

> My course of study had led me to believe, that all mental and moral feelings and qualities, whether of a good or of a bad kind, were the results of association; that we love one thing, and hate another, take pleasure in one sort of action or contemplation, and pain in another sort, through the clinging of pleasurable or

painful ideas to those things, from the effect of education or of experience.

Reflecting on this he comes to the conclusion that there must always be something artificial and casual in associations thus produced, and he proceeds:

> For I now saw, or thought I saw, what I had always before received with incredulity—that the habit of analysis has the tendency to wear away the feelings.
>
> No associations whatever could ultimately resist the dissolving force of this analysis, were it not that we owe to analysis our clearest knowledge of the permanent sequences in nature; the real connexions between Things, not dependent on our will and feelings; natural laws, by virtue of which, in many cases, one thing is inseparable from another in fact; which laws, in proportion as they are clearly perceived and imaginatively realized, cause our ideas of things which are always joined together in Nature, to cohere more and more closely in our thoughts.

Here then we may see the secret trouble, the worm gnawing at the root, this realization of the divorce of feeling from fact. This is the real tragedy of mechanism and scientific materialism. It is foolish to denounce it as wicked. Those who have believed it have without exception been men of goodwill, high-souled, benevolent unselfish workers, men like the Roman poet Lucretius, indignant at the

cruelty of religion and the misery of superstition, braving unpopularity and dishonor in their zeal to set man free. The tragedy is that as they grasp at what for them is the reality, the beatific vision, which alone they care for, vanishes.

V

MIND AND NATURE AND THE PRINCIPLE OF RELATIVITY

SINCE the beginning of the present century and in the lifetime of our generation there has occurred a profound change in the conception of the nature of the scientific reality of the physical universe. With it has come a new and entirely unforeseen philosophical importance in the problem of freewill. Until now this has been a predominantly, if not exclusively, ethical interest. It has now become a metaphysical interest. Whether freedom be fact or illusion as we meet it in the spheres of economics, politics, religion, individual and social morals, it has seemed hitherto to have no place and no relevance in the spheres of mathematics and physics. Now, however, in consequence of the new principles which these sciences have formulated to interpret the phenomena of nature—new mathematical and physical principles—many philosophers are realizing that the mathematicians and physicists are proclaiming the metaphysics which Leibniz put forward and Newton rejected, the doctrine that the real constituents of nature are free, self-developing

individuals; that the common universe to which the laws of nature apply is not an independent, material existence, in an absolute framework of space and time, into which our individual activities are somehow interpolated, but that this physical world itself is an extrapolation of individual activities; and that life and mind are not excrescences or casual appearances or symptoms, healthy or unhealthy, of the almost spent energy of a dying world, but constituent principles of its reality.

Such a metaphysics, if it be a tenable doctrine, puts the freewill problem in an entirely new light. Hitherto the philosophical difficulty in regard to freewill has not been to recognize the fact if it be a fact, but to validate the truth. It is easy enough to point to the fact of freedom in human experience as a consciousness or feeling. It is only when we seek an outlet for the possible exercise of the freedom we feel we possess that we find every avenue blocked by the efficient causality of the natural world, which presents an unbroken chain compacted of necessity. Even when the sceptical principle is applied to causality and the reality of causal connection is challenged, the sceptical attitude does not affirm freedom; it only as it were calls a halt before the necessary confession of ignorance.

The new principle carries us right beyond such halting scepticism. The universe includes us, however independent of it we may assume ourselves to be, and knowledge of ourselves

must enter into our knowledge of the world. The universe comes therefore to present a two-fold aspect, an aspect of freedom and an aspect of necessity, and the task is not to reduce one to the other or to discover how the illusion of freedom is generated, but to understand both aspects and see that they are not contradictory but actually complementary.

The conflict between science and philosophy has led to the determined effort to delimitate the realm of each. It is generally conceded that the main concern of philosophy is the inquiry how we know the physical world, and the simple concern of science is to discover what the world we know really is. It has always seemed that the two questions, How we know? and What we know? can and ought to be kept apart. Indeed in the great periods of progressive scientific discovery it has been demanded almost passionately that they shall be kept apart. Everyone can see how intimately connected they are and no one can be satisfied to be left in final doubt with either, yet to join the two inquiries together has seemed necessarily to confuse the issue. Science in particular has clamored for a hands-off policy, and philosophy has been more or less reconciled and has often resigned its claim to deal with the realm of existence in consideration of its being allowed to retain the realm of value. It is however just this separation and aloofness which has been found disastrous for science itself. The new principle, the revolution in the

scientific concept of the physical world, is due to the discovery that the nature of the activity of the knower in knowing, and the subjective conditions of observation, are essential factors in the successful coördination of experience, which is the great object of science. This is no new discovery for philosophy but it is a new departure for science.

The new principle is not new in philosophy, for the greatest philosopher of the modern period, Hegel, may be said to have raised it to the front rank as a philosophical method. He described the view of cognition which presupposes the object known to be a world already in existence and the knowing subject to be a *tabula rasa,* as an "outside theory of knowledge" (*eine aeusserliche Auffassung der Erkennens, Logik,* 226 Zusatz). This outside theory of knowledge seems to most people to correspond to what they imagine to be fact. If it could maintain its consistency for reflective thought there would be no need for philosophy. Even philosophers feel that they are called upon to justify it and judge the success of their theories by a common-sense standard. The various forms of realism which are held by philosophers today are attempts to rationalize it, but it always has to meet the insuperable difficulty that it is equivalent to saying that knowledge is objectively unverifiable and subjectively unintelligible. As matter of fact all the new realisms which are so prevalent and so diversely interpreted in modern philosophy

fall back on a principle which they have to acknowledge is essentially irrational, and which they describe as animal faith, common sense, will to believe, and the like.

Hegel is not studied much at first hand today, and even those who accept his dialectical method and rational principle find they have to reinterpret his doctrine in order to bring his philosophy into accord with our modern world; yet it is a remarkable fact that all who read him with sympathetic insight find that he is illustrating and carrying out the very principle and method which in the hands of mathematicians and physicists today is leading to new scientific generalizations. This is not generally admitted and I am well aware that it stands in need of defense. The amazing genius of Hegel has suffered from two unfortunate circumstances, one a complete misunderstanding of his doctrine of the nature of the efficiency of the agency he attributed to logical process, and the other to the peculiarly obscurantist character of his polemic against the experimental method in science. The first is a question of right interpretation; the second may be explained but cannot be defended. I will say a word on each.

With regard to the first. Hegel is generally identified with the paradoxical theory that we make the natural world by thinking it. This has been the source of endless amusement to the wits of his own day and ever since. It may be confidently said however that this view of Hegel's doctrine can only be held by those who

cannot or will not take the trouble to understand him. The fact of knowledge is to Hegel self-evidence that the world is rational through and through. Hegel's discovery, and it is one of the world's real discoveries in philosophy, is that reason is discursive and that its mode of active progression is dialectical. Reason is not passive, but active. It moves from affirmation through negation to new affirmation. The method of philosophy according to Hegel is, if we may borrow an expression of a present-day philosopher (Bergson), to install oneself within the movement, to become conscious from within of this logical activity and follow it in its self-development. The opposition between thought and reality, mind and nature, will present itself first as blank negation, but no impassable abyss separates them into two independent realms; the affirmation passes, by the logical agency itself, into the negation and returns to itself richer and raised to a higher stage. If we set aside as subsidiary the particular form in which Hegel expressed this principle we shall find that it is precisely the principle which in a different way modern mathematical science is following in its interpretation of the physical universe. We may set side by side with the great saying of Hegel, "the Real is the Rational and the Rational is the Real," the implication in the principle of relativity that the measurements of natural events can only be interpreted in terms of the measuring, or more generally that the coördination of the physical universe is not

from an absolute system of reference but always from a chosen frame of reference and relative to the conditions imposed on the observer attached to it.

With regard to the second point—Hegel's direct hostility to the experimental method of science—his rejection of it as irreconcilable with his method of rational deduction by the dialectical process of logic, a method which he has elaborated in minute detail in his philosophy of Nature, has led many modern followers not merely to discard this section of his system, but to suggest that the Nature-philosophy can be detached without loss or injury or discredit to the remainder. This is impossible. The Nature-philosophy is an essential part of the scheme. In fact the transition from the absolute idea to the physical world is the pivotal point of the scheme. If it is unsound in principle then the whole system falls. Before passing judgment however on Hegel's obscurantist attitude to physical science, as we recognize physical science today, we have to remember that the scientific conclusions and theories which he rejected with sarcasm and scorn were in every case disputable on scientific grounds and nearly always found to depend on alternatives both of which would be rejected or at least seem inadequate in our world today. It is at least curious that this part of the Hegelian system, the *Naturphilosophie,* which is the stumbling-block and rock of offense to his followers today, was the main

rallying ground of his contemporary disciples. The fact is that we are only now able to appreciate the real status of scientific knowledge. The experimental method is not for us the irrational method which Hegel denounced, largely influenced by the sceptical arguments of Hume. The purpose of experiment is to gain knowledge of the nature of things, but it is clear to us that things would have no nature to reveal were not reason enshrined in the heart of the physical world. This is the Hegelian principle; all that Hegel failed to see was that the experimental method can be made to disclose this reason in nature. The fact had not escaped Leibniz, and in the present day it is finding recognition in science itself. Hegel however had no use for the experimental method; the dialectical method which had carried him triumphantly through the subjective world of logic was, he thought, equally valid and equally serviceable in the objective world of nature.

One of the great turning points in the history of modern philosophy was the idea put forward by Kant that the laws of nature are forms of the order which the mind imposes on nature and not something in nature which is brought to the consciousness of the mind. He described it as a Copernican revolution in philosophy, because instead of regarding the external world as the source of the order of nature we should now by the new principle see the order issuing from the mind itself. The new principle of

relativity is based on the thorough and unreserved application of this idea to the mathematical measurements of natural events out of which the laws of nature and the principles of physics are formulated. When I identified the Hegelian dictum that the real is the rational with the relativity principle that the measurements of natural events can only be interpreted in terms of the measuring, the remark to any who have not studied the new theory and followed its historical development must have sounded paradoxical, if indeed it was intelligible. I must now therefore try to make the meaning clear, for it is the point in the new scientific position which concerns most intimately our problem of freewill.

The physical universe, the object of our scientific knowledge, is the assemblage or totality of all real events, that is, events which actually occur in space and time as distinct from thoughts, imaginings, fictions, dreams and such like, which exist only subjectively in the mind. Every real event is fixed or determined with regard to every other real event by a distance in space and an interval in time, and what we do when we measure space or calculate the lapse of time is to get accurate distances and intervals which we can then compare with one another, and place the constituent events of the universe in an actual order of right and left, above and below, before and after, relatively to one another and absolutely in their totality as constituting the universe. The way we make

measurements is simple enough. For distances we take a rigid rod freely movable, and for intervals we take a clock contrived to register an even flow of time. We know by experience that no rod or clock which our human hands can fashion will give us the ideal accuracy the mathematician requires, but Descartes pointed out a geometrical principle which enables us to give theoretical perfection to our measurements. It is the principle of coördination. We take an actual point (we are dealing now of course with mathematical factors) and through it we draw three straight lines at right angles to one another, that is, we represent by the direction of a line each of the three dimensions of space. These lines are the axes of coördination, or as we say the three coördinates, and their intersection provides a frame of reference. We have now the means of determining the absolute position of every point in the whole spatial universe. To fix the position of any point we have only to draw three lines from it perpendicularly to the three coördinates of our frame of reference. To determine the distance separating any two points we have only to calculate the position of each to the same frame of reference. We can plot the line of a movement by noting the position of a moving point at successive instants. All these measurements are of distances and by this method we obtain them directly. We cannot measure intervals of time by any method which refers only to time and not to space, so to measure time we

have to adopt a secondary device. We take some self-repeating spatial movement which we presume to be uniform and we mark equal unit divisions of the space traversed and measure the time intervals by assuming their correspondence with the stages of the movement. For all practical purposes the diurnal revolution of the earth on its axis together with the annual revolution of the earth in its orbit supplies us with the means of constructing a standard clock.

Until this generation this mathematical procedure has seemed adequate. In practice it might be clumsy and ideal accuracy might be unattainable, and particularly in regard to time the absence of any means of direct measurement was a distinct drawback, but all this notwithstanding there was no reason to suspect any theoretical defect of principle. Of course astronomers had to take into account the movement of the earth, but its velocity was known and also the far greater velocity of light, and therefore it was a simple mathematical calculation to allow for it. There might indeed be many other complications of moving systems yet to be discovered which would involve corrections, but these should always be possible, because as the framework of the whole universe was the immobile space itself and the uniform flow of time, measurements must ultimately refer to these.

The development of mathematical and physical science has led to the discovery that in

believing our measurements to be objective measurements of absolute space and time, subject only to corrections for errors due to the subjective conditions of measuring, we have been the victims of an illusion. In reality there is no space and time which is there to be measured and measurable independent of the measuring. We have discovered that there is a subjective condition which applies to all observers of nature who as scientific observers want to coördinate the phenomena they observe, and this condition simply negatives the possibility of an absolute system of reference, that is, the existence of a space which is the immobile framework of the world for everyone and the existence of a time which flows uniformly for everyone. This subjective condition is a surprising and disconcerting discovery. When once it is understood however it is found to be a very simple matter, even though it alters our whole idea of the nature of the physical universe. We must all come to terms with it. We have got to understand it, for whether we like it or not the old science has passed away and the new science has come in its place.

Let us consider then our measurer measuring distances and intervals, not we will suppose in our ordinary clumsy way with a yard-measure and a stop-watch, but with the ideal apparatus of the pure mathematician and the accuracy and precision he acquires by means of his notation. He will construct a frame of reference with three axes of coördination, one for each

of the three spatial dimensions, length, breadth and thickness. The three axes will be interchangeable and the only difference between them will be in direction. They may be freely rotated but will always be at right angles to one another. It is clearly a necessary condition that the length axis, for example, should be able to be turned in the direction of the breadth axis without undergoing contraction or expansion, and so with each of the others. Now in order that such a condition shall be fulfilled the observer must himself be attached to the frame of reference, otherwise it would not be for him a means of coördination, and he must be at rest in his frame of reference, for if he and his frame of reference are moving in relation to what he is measuring the axes of coördination will all be thrown out. A moment's reflection will show that the successful measurement of anything of the nature of a physical object must depend on these conditions. Every measurer therefore must fulfill these conditions, namely, he must take a frame of reference and attach himself to it; he will then have his interchangeable axes of coördination. But in fulfilling these conditions he finds he is constructing his space, for clearly the space he is measuring must conform to the conditions of his frame of reference, and as his system is at rest in relation to all that is moving, he is constructing his time. Now comes the difficulty. The frame of reference which is at rest for the measurer using it is moving

for other measurers using other frames of reference each of which is at rest for its user. The measurements which will be satisfactory for each measurer in his own system will be all awry for every measurer in another system, measuring under the same conditions, for the systems will be moving relatively to one another. If, for example, A and B are measuring the same natural phenomenon from frames of reference which are moving relatively to one another, A will declare B's measurements incorrect, B will declare A's incorrect, each saying that at least one of the axes of coördination which the other is using shortens or lengthens relatively to the other two. There exists in nature no means of deciding between them, and when the dilemma is faced it is seen there is only one possible conclusion, namely, that the measurements of each are correct but the space and time which each is measuring are different. The modern physicist finds therefore that he must qualify all his statements of facts when he refers to the spatio-temporal relations of events. He must indicate for what frame of reference the measurements are given, for only for that frame of reference will they be true.

It is difficult to explain the real difference between the common-sense view of the universe—that it is a material system in an absolute space and time in which we who observe the phenomena of the natural world are simply spectators or contemplators—and the new view, which the principle of relativity requires us to

take—that the conditions imposed on us as observers determine for us the space and time and the materiality of the world. The important concept of the variability of space and time may however be brought home to us by a simple, even if it be an extravagant and fantastic, illustration. Let us imagine one of the continental trains to be perfect in providing all the necessities of existence and to be continuously journeying to and fro, say, between Chicago and California, and then imagine someone whose life has been passed on such a system. This train-dweller would know the world outside the train only by the view from the windows of the carriages. He would measure space by the interval of time occupied in the journey and would mark the divisions of time by the stages of the journey. Now while the space and time of this denizen of the train would be identical with the space and time of the denizens of the continent through which the train passes, they would also be completely different, for the train-dweller by the hypothesis has no means of knowing by experience the space and time of the continent. It is the space-time which each observer experiences himself which appears to him absolute, and for him it is absolute, however relative it appear to observers of the relative translation of the system to which he is attached, in this case the train. Also the train-dweller would naturally suppose that the movement was not movement of the train, for he would not experience the train

movement; he would think the landscape moved, and if he came to learn that the train moved it would not be by any experience of movement. This is a homely and perhaps too simple an illustration, but if we make the effort to imagine the hypothetical case we may gain a clear notion of the principle. In fact we may change the train and the continent into the earth and the firmament and we have not an illustration but the fact illustrated.

I want now to call attention to a most important aspect of this modern scientific problem. The revolution in scientific ideas does not imply that mathematicians and physicists have become idealist metaphysicians in spite of themselves. Nothing could be a more complete misunderstanding of the situation. What it does mean is that they have had to reconstruct their idea of physical reality on an entirely different and new principle. According to this principle no spatio-temporal measurement has any independent value, because space and time do not refer to an absolute frame of reference. Whenever we are given measurements we have to know whose space and whose time are referred to before we can assign their value. The mathematician finds a new task before him. He has to discover how out of true measurements, which are only true for the system to which they refer, he can construct a science of the universe which shall preserve all the objectivity and all the absoluteness which science requires and without which science would not

be science. The great triumph of modern thought is to have accomplished this task. The principle of relativity, the formulation and successful demonstration of which we owe to the genius of Einstein, has done this. It accomplishes it by devising equations which remain invariable when the measurer passes from one frame of reference to another, equations which hold good therefore for all frames of reference in which the subjective condition of observation is fulfilled. Philosophically it is not a change from realism to idealism and in truth has no relevance to these epistemological theories; it is the abandonment of an abstract objectivity, the change from an abstract affirmation of the independence of the object to a concrete view of an intimate and essential correlation of observer and universe as the basis of physical science.

Let us now consider another aspect of the modern view of the physical reality of the universe which is very important in its philosophical significance. This is the new concept of materiality which has followed the discovery of the electrical structure of the atom. The electron theory was formulated in 1895 and at once changed the whole mental picture of the unseen world of the atomic forces. Physics and chemistry have been engaged ever since in the task of re-forming the sciences in the light of the new theory. Before the discovery of the electron the physical universe had been conceived, for all scientific purposes, under the

familiar guise which Newton had made us regard as a natural view of things, a view of the physical world which, however it might be challenged by idealist philosophers and other more or less extravagant speculators, accorded with common sense. There was a limitless extension or space and a uniform flow of succession or time, and these were the framework of the universe within which masses of disintegrable matter were moving under the influence of forces of inertia and attraction. The business of physics was to discover the laws of movement and interpret the particular phenomena in accordance with them, and the business of chemistry was to discover the constituent elements of the masses and explain the qualities of things as an effect of their combination. Science was materialistic not in the meaning which denies spiritual values but in the meaning that the ultimate reality for it was matter, a real stuff occupying space and excluding from the space it occupied everything which was not its peculiar possession, a stuff which might change its position in space because it was also in an order of succession in time. The new discovery has completely changed this meaning of physical reality. I will call attention only to the philosophical significance of the change. Materiality is now for science an aspect of the physical universe, it is no longer the substance of the universe nor an attribute or quality of a substance. Materiality is the form which limitation takes

when one activity is opposed to another. Instead of the idea of an ultimate, irreducible stuff or space occupant consisting of constituent atoms of elemental simplicity, aggregated in masses held together by forces of various kinds, we have now the idea of radiant energy, existing in two forms, viz. in the free form of radiation and in the fixed form of a composition of forces in more or less stable equilibrium. The atoms of modern physics are systems in which the force of radiating activity is for the time being neutralized.

A more complete change in the meaning of a fundamental idea could hardly be conceived. We retain the terms of the old concepts to express the new, but we have given to the old terms an entirely new meaning. Materiality is the form which the limitation of an activity assumes to the activity opposed to it. It is the definition of the opposition. On a calm day for example I am practically unconscious of the existence of the atmosphere, that material ocean on the floor of which I live, but let a breeze spring up or a storm rage and at once the atmosphere materializes. In the laboratory moreover I can subject an atmosphere to cooling and pressure until it will become a liquid and then a solid. Yet throughout all these changes the constitutive character of the atmosphere does not alter. This is only an illustration. The materiality of the universe is never absolute, it is always relative to the kind of activity in being.

In the new conception of the electron the last stronghold of scientific materialism is invaded. The first idea of the electron represented it as a refinement of the atom; the electron was described as a kind of particle or little brick carrying a charge of electricity, of homogeneous substance and primordial quality. The numerous chemical elements which had so far been regarded as simple and irreducible were now thought to be really composite, different constructions of this particle whose only quality was the electric charge it carried. Mathematicians and physicists however were not long satisfied with so crude and irrational a concept. The electron is not something which thrusts itself upon our attention, on its own account; it is generated out of the mathematics of a field of force. It is ultimately therefore a geometrical concept. It is literally, in the well-known words of Descartes, created out of extension and movement. We have therefore between the science of the nineteenth century and the science of the twentieth century the most complete contrast in basic principle. The nineteenth century regarded matter as the basis of activity, the twentieth century regards matter as a variable aspect of activity. For the nineteenth century matter was absolute, the immediate and exclusive seat of agency; activity was mechanistically determined by materiality and there was no place in the physical universe for freedom. For the twentieth century activity is original and free,

and acquires efficiency by materializing. Materialization is the systematization and organization of energy, and energy is only the objectification by reflective thought of the experience of activity.

I come now to the most significant of all the implications of the principle of relativity in its direct bearing on the freewill problem—the new meaning which the principle gives to the relativity of knowledge. Whether we consider cognition on its subjective side as a mode of activity or on its objective side as giving ideal form to reality, according to the principle of relativity it is a function of the coördinating activity of finite, self-centered individual agents. Knowledge, truth about reality, is the form which reality assumes to the agent in response to his need to coördinate the universe for the exercise of his finite, self-originated activity. Science therefore for the new principle is relative in a wider and more fundamental meaning than the *esse-percipi* doctrine of the old idealism, for it is relative in a meaning which goes beyond and behind perception, inasmuch as it accounts for perceptive activity itself. We are under the perpetual illusion that knowledge is something we share, that it is a common fund on which each draws for his own personal account. The principle of relativity rests on the discovery that this is untrue in fact and on the recognition that it is theoretically impossible. I can no more share the knowledge of another person than I can share his exist-

ence. What we call common knowledge is not perception as we have hitherto assumed, it is conception. It is not an enlightenment which comes from contemplation of a universe open to all. It is an inference which we draw from our common nature as active subjects of experience, an inference which is possible because we all think alike and can compare our experience, because reason is discursive and there is interchange of ideas in intercourse between subjects, because every observer coördinates the world of his activity not from a peculiar objective angle but from an individual subjective standpoint. The old science assumed that there is a universe one and the same for all observers and that the differences of individual knowledge are due to the perfection or imperfection of the individual's apprehension. The new science assumes no universe to which all observers can refer; for it all observers are measuring the phenomena of their world, each with his own axes of coördination and constructing from his measuring the reality which he measures.

Let us now sum up the stages in the formation of the new world view which mathematics and physics have given us, and then consider what it means for philosophy.

Science has definitely abandoned the Newtonian assumption of a space-time framework providing an absolute system of reference in which every real, existent object has its definite place and every real event its definite time.

Science has also abandoned the idea that matter is a space-occupying stuff with primary inalienable qualities able to give rise to secondary qualities in its relations to subjects of experience.

Science has abandoned the idea that forces inhere in matter either in its constituent elements or in its mass aggregations. Movement is not originated by the influences of masses attracting or repelling one another proportionately to their distance from one another in space and to the interval separating them from one another in time.

Science has discovered that the chemically distinguished atoms or elements are not irreducible. Not one of the chemical elements is simple and ultimate; all are composite.

Science has abandoned the idea that knowledge is contemplation, that the universe reveals itself by impressions on the mind of the conscious observer, that the mind which receives the impressions is a *tabula rasa.*

The positive discoveries of science are:

That the one constant phenomenon for terrestrial observers of natural events is the velocity of light. It is a finite, critical velocity, that is, a velocity which does not vary with the velocities of the systems from which it is observed. The velocity of a ray of light having a terrestrial source does not vary with the known variation in the acceleration of the earth's annual movement in its orbit round the sun.

That the space of the physical universe is not structureless, that the geometry of this space does not conform to the postulates of Euclid, and that time is not independent of space.

That there is neither space in itself nor time in itself. The physical universe is a space-time, four-dimensional continuum, and the four axes of coördination by which events in the universe are measured vary infinitely for systems of reference moving relatively to one another.

From this it follows that the physical universe as science now represents it is not a static reality offering a block objectivity, either systematic or unsystematic, orderly or chaotic, to the discerning contemplation of a disinterested spectator. It is now conceived as the totality of events which occur, and physical science is the outcome of the coördination of events by interested observers. All world events are related by the distance which separates them in space and the interval which separates them in time. Distances and intervals are not absolute, they vary for all observers according to the relative movement of the systems of reference to which observers are attached.

If now we accept this scientific account of the physical universe, what are its elemental constituents? The old material constitution is gone. The space-time framework is relative, not absolute. What then is fundamental?

What is absolute? What is the pivotal fact on which the whole conception revolves? Clearly the central basic fact in the new conception, the fact on which everything depends and from which the whole scientific construction is reared, is the observer attached to his system of reference and for whom that system is at rest, not a disinterested observer contemplating an outside reality, but an observer who must coördinate the phenomena of nature for himself as the necessary condition of his active participation in reality. The principle of relativity and the new scientific concept of the physical universe starts from this and reverts to it.

What sort of metaphysical theory will rationalize this new concept of the physical universe? My answer is quite definite. The recent advances in the biological and psychological sciences, and the living principle they illustrate when they are brought into connection with the recent advances in the mathematical and physical sciences and the new principle of relativity they have adopted, indicate the emergence of a new metaphysics of reality. I call it the Monadic theory. The name serves to connect it with the philosophy of Leibniz and also to mark its opposition to the atomic theory of the materialists. I will now outline the theory in its broad principles and in what is essential to it, without attempting to fill in the details or support it with arguments.

First, then, the principle of individuality

characterizes real existence wherever we meet with it. Everything real is individual, and this means that to exist is to be active, self-centered and self-reflecting. We cannot divide an individual into parts on any principle whatever. A man is not an assemblage of trunk, limbs, brain, muscles and the rest of his anatomy; all of these derive their reality from the individual. If man is not the assemblage of the organs which serve his activity, *a fortiori* he is not the constellation of the bits of stuff or of the molecules, atoms and electrons which we conceive to be the basis of stuff. Whatever can claim to be a real existent therefore must be individual, that is, it must have a nature of its own expressing itself in an activity which is self-originated and self-referred. The principle of individuality is the main ground of the Monadic theory, and we may state the theory in terms of it. If the universe is composite, the things which enter into its composition must be simple. The only things which are simple are individual, for only individuals are indivisible and uncompounded.

Secondly, the principle of individuality which each of us knows by direct experience in his own self-consciousness governs the living world in the whole of its extent. A living thing is only conceivable as an individual activity. It is individuality which distinguishes living activity from mechanical movement, and in fact every known form of life—animal, vegetable, microbial—is individual. Personal-

ity and self-consciousness characterize individuality in its higher forms, while in its lowest forms, as for example in seeds and germs, consciousness is absent but individuality is there. Every individual has its own inalienable outlook on the universe of which it is a constituent, and the form which the universe assumes to it is determined for it not by the universe but by the nature, range and extent of its own activity.

Thirdly, the non-living world of inert material objects and mechanically determined events in space and time is not self-existent in its own right. It is an aspect of the living universe, which varies for every constituent agent. It is not illusion. The illusion occurs when we regard the physical world in its inert aspect as independent of the activity of the individual and self-revealing. The physical world takes shape in response to the individual agent's need of law and order as the condition of expressing activity in efficient actions. It is an individual need to coördinate the world. Thus space and time are determined for each individual by the coördinates he uses and the frame of reference he chooses, and materiality is determined by the resistance to his activity of an opposing movement.

The Monadic theory therefore reverses the common-sense order of reality which starts with the assumption of a self-existent, objective universe and supposes living activity and consciousness to be late, contingent, emergent

facts. The Monadic theory makes no initial assumption but starts with direct certainty, with the identity of knowing and being in self-consciousness, with the "I think therefore I am," which is the one proposition which affirms its truth in the very operation of doubting it. It passes to the recognition of other centers of living activity, other individuals. We cannot know these as they are in themselves, we know them by inference only; the inference may be immediate, but it is an inference. We interpret their actions on the analogy of our own experience. Finally it interprets the objective world as the aspect which all the constituent, real activities of the universe present in the relations of each to all and of all to each. Thus, for the Monadic theory, if all activity should cease, all existence would disappear without remainder and leaving no trace.

The Monadic theory is not a new metaphysics, but for the first time in the history of philosophy it can claim to be in complete accord with physical science.

Such is my philosophical theory, based entirely on my interpretation of empirical science. I know of course that it can be challenged, and indeed that it is challenged. The strong trend of philosophy at the present time is toward realism, naturalism, behaviorism, materialism. One great change however has come with the new scientific advance. The strength of materialistic systems of philosophy has always been hitherto the claim that scien-

tific method can be justified only if we accept the realistic assumption in metaphysics. Realists have always thought they were championing scientific truth. Undoubtedly this did apply to science in the nineteenth century. It does not apply to science today. No idealist philosopher today has to meet the challenge, How, on your principles, is physical science possible? And no worker in the scientific laboratory today feels that in the interest of science he must heed the warning to beware metaphysics. The new scientific concepts and principles are avowedly and consciously metaphysical.

I come then to the metaphysical doctrine of freewill which I have sought to elucidate by examining the various forms the problem has assumed. I may now sum up my own conclusions.

If we set out from the principle of necessity we can never by any kind of reasoning arrive at the principle of freedom, whereas if we set out from the principle of freedom we can deduce the principle of necessity, for we can see how the idea of determinism is generated out of the very conception of free activity.

When we bring these abstract principles to a concrete application we see that mind, spirit, life and consciousness are the expression of the principle of freedom, for they are essentially activity, and activity is essentially free. Materiality on the other hand is the expression of necessity. Every material thing is fixed,

static, inert, determined completely by its external relations to other things in space and in time. That mind should generate materiality is not only intelligible, it is our common experience. We are continually forming habits. That life develops fixed forms is manifest in organization, in reflex actions and in instinctive responses, but that inert matter should generate life and consciousness is unintelligible.

I will add one last important reflection. Modern science now claims to be able to bring the whole existent universe in space and time within its scheme of measurement. The human intellect confined in its exercise to an infinitesimal contact with the universe in space and time which it comprehends in its outlook can yet include within one system the whole range of the stellar universe, even including the island universes which we now know are lying beyond it. To express the dimensions of this universe we have to reckon in light-years each of which expresses as one spatial unit a distance of six million million miles, and we have to reckon light-years in millions and million millions. Science assumes, and with good reason, that throughout this range, the terms of our own direct experience hold good, and that the same laws of nature, the same mathematical and physical conditions, prevail as those with which we are familiar on this insignificant planet of an insignificant star. Now if this universe had to be thought of as it used to be thought of, a self-existent reality revealing its

absolute nature to an infinitesimally unimportant observer, is not the improbability of our knowledge being real knowledge and representing truth about this reality so great as to be even the acme of absurdity? What is it then which rationalizes this modern scientific idea of truth? It is rationalized by the principle of relativity in an entirely different way to that of the old assumption, one which is based on the fundamental idea of free activity. Place an observer, it says, at any point-instant whatever and he must coördinate the universe on the same principle as we do attached to this terrestrial system. He will take a frame of reference which for him will be at rest, and his space-time coördinates will obey the condition of the constancy of the velocity of light. Thus science has rationalized the universe by basing its order and regularity on the activity of the subject of experience in any and every environment Thus a new meaning comes into the concept of infinity. The universe is not infinite in the old meaning of limitless extension and duration; in this meaning it is finite. It is infinite in a new meaning, in the meaning that, however variable relatively to one another are the frames of reference, the dimensions remain constant for the subject of experience because he takes his coördinates from the velocity of light and not from an absolute space-time system. This means, to take the illustration of the famous traveler Gulliver, that we may be living in Brobdingnag or living in Lilliput, without

any possibility of knowing what are its real dimensions, since our own dimensions will contract or expand as we change from one to the other.

NOTE: It does not come within the scope of this study to expound the new principles in physics and mathematics and particularly the principle of relativity, and I can only refer the reader interested in the general philosophical implications to my other writings, more especially *The Principle of Relativity* and *A Theory of Monads* (Macmillan).

The relevance of the principles to the problem of freewill is strikingly illustrated in the two quotations which follow, one from a leading exponent of the scientific thought of last century and the other a recognized contemporary authority:

> If the fundamental proposition of evolution is true, that the entire world, living and not-living, is the result of the mutual interaction, according to definite laws, of the forces possessed by the molecules of which the primitive nebulosity of the universe was composed, it is no less certain that the existing world lay, potentially, in the cosmic vapour, and that a sufficient intellect could, from a knowledge of the properties of the molecules of that vapour, have predicted, say the state of the Fauna of Great Britain in 1869, with as much certainty as one can say what will happen to the vapour of the breath on a cold winter's day.—THOMAS HENRY HUXLEY (1869).
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> It is now generally accepted that in the reconstruction of ideas required to remove the present discrepancy between classical and

quantum laws, the quantum laws must form the basis. These grade into the classical laws when the quantum numbers are very large; and it is only then that the classical conception of the physical world—including space, time, electrons, force, etc.—has any application or meaning. In this reconstruction all the determinism is removed from the laws of physics; the apparent determinism is found to be merely high probability. The probability is high (amounting practically to certainty) when averages of large numbers are considered; but in individual processes only moderate odds are concerned. The new quantum mechanics contains only laws which decide the odds; it apparently has no cognizance of any factors deciding what actually will happen. In the old conflict between freewill and predestination, it has hitherto seemed that physics comes down heavily on the side of predestination. The quantum theory has entirely removed this bias. Whatever view we may take of freewill on philosophical grounds, we cannot appeal to physics against it. The latest picture of the atom contains no mark or factor to decide what *that* atom will do next (although it contains factors deciding the average conduct of a number of such atoms); and whilst further developments in the theory may possibly disclose such a mark, it is on the whole rather against the spirit of the modern conception to expect this.—Arthur Stanley Eddington (*Nature*, Feb. 26, 1927, p. 328.)

VI

THE POSITIVE CONCEPTION OF FREEDOM IMPLIED IN LIVING ACTIVITY

TENNYSON in an often quoted poetical fancy has given expression to the idea of the overwhelming mystery of existence which seems open to us and yet concealed from us in the contemplation of a humble form of living activity.

> Flower in the crannied wall,
> I pluck you out of the crannies,
> I hold you here, root and all in my hand,
> Little flower—but if I could understand
> What you are, root and all and all in all,
> I should know what God and man is.

The task which I propose to undertake is conceived in this spirit, but we must conduct it without regard to the poet's rhapsody. Let us examine in the strict scientific spirit a form of living animal activity, bringing to its consideration all the resources of the physical, chemical and biological sciences at our disposal, criticizing and analyzing it with all the aids we can derive from our logical, mathematical and metaphysical training, in an endeavor to under-

stand the nature of the problems it presents and to discover what hope there may be of solving them. It is a task which however much it may be facilitated by expert technical knowledge is not beyond the power of anyone accustomed to the discipline of clear thinking and reflective discursive reasoning to undertake. I am going to choose the life history of the honey-bee. Everyone is familiar with it, and I choose it as an example of living activity on account of certain obvious advantages, but there is nothing privileged in the choice; the observation of any form of life activity would give identical results. The observation hive is a happy contrivance by which the whole life history of the animal can be studied without any interference with or interruption of the domestic and social economy of the hive. It is true of course that our observation is of the outward behavior of the insects; we can only infer their subjective experience, and we are debarred by a natural inability from any penetration into its mode. Let us suppose then we are observing the hive.

I will take for granted that we know already the life-history of the honey-bee and the general organization of the hive, for we may all know this without ourselves ever having observed anything, and we should only know it directly by intensive, long-continued observation. There is however something which will strike the observer as most extraordinary as soon as he is familiarized enough with the first

view of the swarming insects on the comb to attend to the work in progress. It is that he can follow through its stages the emergence from the brood-cell of the imago of the worker-bee, and to all intents and purposes witness the birth of the independent adult individual. The cell is sealed during the whole time of the change from the pupa stage to the imago. When the new individual bee is fully formed it cuts the seal of the cell and enlarges the opening for itself and by itself, makes its own way out and at once takes its part in the active work of the hive. What we first notice is a little black dot appearing on the white sealed top of the cell; this is the cutting instrument with which the mouth is furnished, and it will gradually work its way round until the aperture is large enough for the creature's exit. We will then see the bee draw itself out, spend a few seconds, it may be, in getting its cramped limbs and wings spread out, and without demanding or attracting the attention of the other swarming individuals, forthwith engage in its special task. If now we follow it carefully we may see it take up one definite activity, without affording us the slightest indication of the way in which it has been determined to this special task or revealing anything which will enable us to understand how it has exercised an apparent choice.

The peculiar phenomenon to which I want to direct attention could be illustrated equally well if I had taken any other living activity of

the hive—the making of the honeycomb, the storing of the honey, the laying of the eggs, the nurture of the brood, the segregation of the special brood food, the care of the queen bee, the regulation of the supply of drones. In each and in all of these activities we shall meet with the strange fact—strange because from our standpoint of observers it is entirely unaccounted for by any ordinary way of conceiving the adaptation of means to end—the fact that the whole activity is carried out by means of an independent, self-determining, self-enclosed individual, while the end to which this individual activity is directed is not explicable in terms of individual satisfaction. The end or purpose for which the individual works is not the end or purpose of the individual, but a specific end of which the individual cannot be in any sense cognitive and for the attaining of which it is merely the vehicle. As we observe the creature in the hive all that is open to our inspection is the organization of structure and the responsive functioning of the structure to the stimulus of the environment. We can read in its structure the range of its activity, and we can read in its responses the nature of the stimuli to which it is sensitive. What we cannot observe is the directing will urging or compelling it to perform definite actions which do not minister to its individual needs, for this directing will receives its guidance from the past and the past is now non-existing; and we cannot observe the end or purpose which these

present actions subserve, for this lies in the non-existing future. All efficient living action is individual action. There are no actions which are not the actions of individuals. All individual action is specific action—action of which the form and direction is determined by the species, and all specific action is the past determining the future. For the individual nothing exists but the present: the past is accomplished and without efficiency, the future is undetermined and also has no efficiency—it is not but will be; and yet the present does not contain the causal or intelligible explanation of the actions.

Let us come back to our observation of the individual worker bee emerging into the life of the hive and taking up a special task. We have to recognize that though it is formed for free, independent movement and organized to respond automatically to particular stimuli, with no incentive to perform the functions for which it is structurally adapted other than the satisfaction of the appetites those functions imply, yet it is under the domination of a directing power which is not confined to the present but which is the actuality of the past determining the future in the present. Let me make this quite clear. What we are actually observing is an individual worker bee with its organization, its function, its appetite, its adaptation to the activity of the hive and the economy of the hive; but what we are directly conscious of is an influence overruling its

present activities. The efficiency of this influence supposes the potency of the past, and the finality of this influence the potency of the future.

If this problem is clear, the first consideration to which I wish to draw attention is the complete bankruptcy in regard to it of the materialistic conception and the mechanistic principle. For materialism the present alone is, the past was but is not, the future is not but will be, and the postulate of materialism is that there was nothing in the past which does not in some form survive in the present and there will be nothing in the future which is not in some form existing in the present. Space and time for the materialist are the framework which gives to the universe its continuity. Space is the framework of its objects, time the framework of its events. Space enables us to conceive every material existent to be continuous with the whole of reality existing at the same instant, and time makes the state of the universe at any instant continuous with every previous or subsequent state. For materialism therefore the particular reality represented by the individual honey-bee is the actual constellation of material constituents in its structure, and the behavior of the creature is the consequence of types of reaction, reflexes, instinctive responses which are registered in the structure as its function. It is freely admitted that in living things we have to take account not merely of the actual material contents but of tendencies

and all kinds of action patterns. These appear to be transmissible and to be in fact inherited, yet to be effective they must exist in the present and be inherent in the organization of the actual individual. Consider then whether the most exhaustive analysis of the honey-bee on materialistic principles will yield even a plausible interpretation of the kind of behavior we have instanced. Why it will not is I think clear to simple reflection. Whenever we are dealing with living activity the materiality or actuality of the individual agent is only an infinitesimal part of the full reality. It is not an unessential part but it is only a part. Matter is only definable in relation to space and time, which for it are limiting conditions. Life comprehends space and time and materiality. This may sound paradoxical, but reflection will show it to be literally true. A living thing can no more be said to exist in a place at a moment than a melody can be said to exist in the single note which at a particular instant may be all that we hear. A living thing retains the past and acts forward into the future. Without its materiality life would have no hold on the present and therefore no insertion into reality, but cut off from the past and the future materiality will not itself support the concept of life.

Let us come back to the real problem of the honey-bee. It is that the individual agent, though to our observation completely equipped for independent individual life, a detached body with a perfect sensori-motor organization, and

within the range of that organization apparently endowed with absolute freedom, is clearly dominated in all its activity by the welfare of a larger whole, a community of which it is a constituent member. This community is not a free association, it has all the characteristics of a material organization functioning as a physiological system; yet there is no material bond such as the nervous system of a living organism provides. We have to content ourselves therefore with the conclusion that there is a reality which we will call life, for we cannot indicate it by any more distinctive term, which in the case of the bee endows individuals with positive freedom and yet makes that freedom subserve an end which is not an individual end but a specific end, the functioning of the common life of the hive. The positive freedom which the individual possesses is not in itself an end but a means to an end. Can we turn this freedom to the advantage of the individual? It seems we should be able, but we cannot. If we take an individual bee and supply it with all individual needs—food, warmth, flowers, sunshine—it will make no use of its freedom for individual enjoyment; cut off from the hive and separated from the activities of the community it will pine and die. We shall find we have cut the invisible cords which bind it to the living. We explain it to ourselves by saying that we are interfering with powerful instincts, but when we think of instinct in this way we are only confessing or trying to conceal our ignorance. The point I

wish to emphasize is that life can and does use positive freedom as a means to an end, and that it is to this mysterious fact we should turn for enlightenment on the problem of freewill.

Let us now take a wider view of the problem. Life which works in and by material individualization is not individualized. We only know life in its universality. There is not a separate living principle for the separate forms of living activity. It would be a gratuitous and useless hypothesis for example to postulate a super-bee activity to account for the activities and the direction of the activities of individual bees. Moreover life has no analogy to force as we are accustomed to employ the idea of force in physics. It is not analogous to the electric charge which gives its energy to the electron. We can only conceive life as purposive activity. If we represent the physical universe as constituted of forms of radiant energy, then life seems to use that energy by directing it into particular channels and organizing it in special creations. Life is not a particular form of matter or a particular kind of force; it manifests itself in the direction of forces and in the disposition of material which it finds to hand and does not create. Life in a sense is one with consciousness, for consciousness enters into the very meaning of living, purposive activity.

This brings us at once to the wider problem of evolution. The life-activity which overrules the individuality of the bee and its free movement to serve the needs of the hive community

and to ensure the continuous existence of the species by successive generations, is not a reality which we can particularize. It is not a quality or a characterization specific to a form of organization. Bee life is only one of myriad modes in which it is manifested. As we observe the individual worker bee and follow its activity from its emergence from the cell to its natural death, we know we are observing a form of organization which has repeated itself by the material continuity of successive generations for untold ages. From the dawn of human history it has excited interest and wonder, and from the records of the rocks we know that it must have existed with all its essential characters throughout past geological epochs, possibly since the time when flowering plants first appeared. We have then a cycle or repetition of individuals by which means the essential bee activity maintains its continuity despite the complete breach in the life history of the individuals which are born and die. What is the agency? Clearly it is not the matter which alone is what we can observe; it must be something we cannot observe, for it is not present but has its reality in what for us is past and future. The agency is life. What we can observe however—and this is the crucial part of my argument—is that the continuity of life in the species is secured by means of the positive freedom which is exercised by the individuals of the successive generations. This freedom is dominated or overruled by the life

principle, but also it is used as a means and as the only means to secure the particular end. By positive freedom I mean that the activity of the individual is self-centered, that the individual is not coerced but responds.

We know then that this hive activity has gone on without noticeable variations certainly throughout the period of human history, and how much further back we cannot say. Also it is now made evident to us by irresistible scientific evidence that it is the outcome of a long evolution. We know also that the particular evolution of the honey-bee is not an isolated phenomenon. It is *prima facie* clear that the activity of the bee is linked with the activity of flowering plants. I need not deal with detailed arguments for the conclusion, which probably few will dispute, and which no one now rejects on scientific grounds, that the present variety and diversity of the innumerable species of living forms of activity—vegetable, animal and even microbial—is the outcome of a continuous and progressive evolution, and that the diverse modes have evolved *pari passu,* with mutual adaptations. What I am now insisting on is the inadequateness of the idea which was the dominating idea of the nineteenth-century biologists, that this evolution can be the natural result of the play of mechanical forces under material conditions. If the argument is sound, that the structure of the individual bee considered as a freely functioning organism will not supply the principle

which determines the bee's actions, it applies to the age-long process of evolution with accumulated force. The evolution of living forms is only intelligible if we recognize a spiritual principle, a principle which not itself material is using materiality as means to an end; a principle which not itself individual is using individuality for efficiency, individuality which can be used as a means because it implies freedom, whereas materiality is absolute necessity.

Let me sum up this argument, to which I attach the first importance. Living activity manifests itself in real actions which are always individual; individual actions are distinguished from mechanical movements by their freedom; free actions are self-determined responses to external situations and not externally determined. This principle of individuality which governs living activity is the contrary of the principle of reciprocity which governs all material movement.

The philosophical world today is divided into two hostile camps under the banners of these two principles. The ideal of the one principle is to be able to reduce all the phenomena of life and consciousness to the law of reciprocity, the law of the equivalence of action and reaction. For those who adopt this principle the real universe is conceived as an interlocking mechanism in which change, novelty, creation have no place. In philosophy they are materialists or natural realists, not necessarily in any meaning which implies a crude conception of matter as

irreducible stuff, whether atomic or plastic in its constitution, but in the general view that the inert is more original than the living. In science they are absolutists, not in the meaning that they reject the principle of relativity but that they interpret it in accordance with their postulate that the physical universe is not mind-dependent. In psychology they are behaviorists, who insist on the identity of thinking with the working of the mechanisms of articulation, or at least who are committed to the mechanizing and materializing of the soul. In ethics they are deterministic and naturalistic. In religion they are fundamentalists in the meaning that religion for them has no basis in philosophy but is a question of the credibility of testimony and to be accepted or rejected on that ground. The conflict between science and religion has no sort of basis in philosophy; it is simply a criticism of accepted dogmas of religion, often a criticism of historical records, concerning their rationality as objects of belief.

The ideal of the other principle is to interpret all the phenomena of nature in accordance with the law of freedom, as it is experienced in the spontaneity and self-determining character of the activity of the individual. The real world is the living world. Inertia, materiality, necessity are derivative aspects of the world, schematizations of existence, relative to the mode of living activity and its determination in actions. Those who fight under this banner in

philosophy are idealists, in science relativists, in ethics voluntarists, in religion modernists.

We have an instance of this conflict between two ideals in the controversy concerning the nature of evolution. There are two theories of evolution at the present time. One is the old mechanistic theory associated with the name of Darwin, the other is the newer vitalistic theory associated with the name of Bergson, and known as the theory of creative evolution. They rest on two diametrically opposite conceptions of the nature of life and consciousness. Life according to one conception of it, including everything like mind and consciousness which we comprehend under it, is a phenomenon of material organization. To those who hold this view there seems nothing contradictory in the idea that matter should acquire life just as it might acquire any new quality in the course of the changes it undergoes in the history of the universe, and having acquired it might forthwith develop this new quality along lines which lead to individualization and to a mode of activity which produces the illusion of freedom. This may be said to have been the metaphysical background of the hypothesis of natural selection by survival of the fittest in the struggle for life, although Darwin himself put forward no theory of the nature and origin of life. Those philosophers who adhere to it today have revived it under the new term "emergent evolution." The crucial point in the theory of emergent evolution is that inert mat-

ter is more original than life, that life or the tendency to organizing activity is a quality which, whether inherent in matter or not, only manifests itself at a late stage in cosmical history and under definite if unknown conditions.

The opposite theory to this is the theory of creative evolution. This is not a scientific hypothesis but a philosophical theory. It is not an arbitrary intrusion of philosophy into the domain of science, it is a concept formed in response to the demand of our rational nature for a complete interpretation of the facts of experience. Just as in the case of the honeybee, when we find actions which we cannot explain mechanistically by the structural organization and functional performances of the individual agents we must seek outside the individual for the controlling agency, so when we take into view the whole expanse of the evolution of life we have to recognize that it is a continuous process which is not exhausted in the present actions of actual living individuals. We must form some concept of this life which manifests itself in the evolution of species, which lies behind the evolution, urging it forward, and which lies beyond it controlling and directing the present for a satisfaction which the present will not enjoy.

The theory of creative evolution depends on a metaphysical principle which appears contrary to common sense and which is opposed to the principle generally accepted in physical science, but which is fundamental in every phil-

osophical idealism. It is the principle that activity is more original than inertia, that change is more fundamental than the thing which changes, that movement can generate immobility but immobility cannot give rise to movement. The principle is justified on the ground that there is no way of conceiving how activity could be generated out of inertia, whereas given activity inertia is produced by simple interruption. Let us however leave aside the abstract argument and turn to the concrete application. The theory of creative evolution depends on the concept of life as an activity which is more original than any of the material organizations in which it finds expression. Life is not only the ground of their existence but is working in and through them for an end which lies beyond them. So conceived, life is not a thing or the property of a thing and it cannot be represented under the imagery of an individual with personal attributes. We cannot for example speak of it as something which has a mind or consciousness. When we think of life as consciousness we mean that consciousness is part of its actual nature. The important thing in this concept of life is its universality. The positive facts which alone are open to our inspection are the particular or individual modes in which life is expressing itself. What we have to conceive in life is the impulsion or urge behind the manifestation and the ideal goal to which it is reaching out; that is, we have to conceive life itself. It is this

necessity of thought which leads us to the concept of creative evolution and it is this concept of creative evolution which gives to freedom a positive meaning.

Let us now see if we can apply this conception to the freewill problem and if it will throw light on the dark places. The argument which I will now ask you to try to follow is, it seems to me, implicit in the idealist principle in philosophy; the particular form in which I wish now to present it is the result of my own reflection.

There is only one way to philosophize, and that is to explain the world by the reality which we actually experience in ourselves. When we start in this way we are led I think inevitably to the conclusion that, contrary to what we at first imagine, spontaneity is prior to necessity. Freedom, freewill, we possess originally of right, and the determinism on which efficiency depends is brought about by the limitation of that freedom. Necessity rules absolutely in the material world, but the material world is not a self-subsistent reality, it is an abstract aspect of the living world. In the living world the principle of individuality is universal, and the principle of individuality is essentially the principle of freedom in the meaning of self-determination. Let individual activity be completely governed by necessity and its individuality is destroyed. And yet without necessity the activity would be without efficiency. Even individual action therefore to be effective must

take the form of necessity. We may say therefore that freedom must generate its negation, necessity. This is what brings about the double aspect of the real world. Finality and purpose can only be interpreted in terms of free activity, efficiency and means or instrumentality only in terms of necessity.

Let us consider again the illustration we have chosen, the life activity of the honey-bee. Here is a creature completely individualized, completely equipped with the means to maintain its activity, to feed itself, to protect itself, to reproduce its kind. It is true, of course, that the worker bee is an infertile female, but this modification of structure is itself subservient to the reproduction of the species, and on occasion if the need arises the grub whose destiny is to be a worker can be developed into a queen. It is quite clear however that we should know but a very small part of bee nature if our knowledge was only of the structure and function of the individual organisms, even though this knowledge were perfect to its minutest detail. To know bee nature it is not enough to know how the individual is fitted to act, we must know how it does act; and to know this we must know the psychical dispositions which constitute its mind. In the bee these dispositions are named by us its instincts. The term is expressive of our ignorance rather than of our knowledge. It means however that it has dispositions to act for ends of which it cannot itself be immediately conscious. The two points to

which I call special attention are these. First, all actions whatever which the bee performs, whether they be obvious defensive responses such as stinging, or vital responses like feeding, or community responses like storing honey or nurturing brood or maintaining the temperature of the hive constant, are individual actions or reactions; they are not mechanically determined actions, as when one billiard ball imparts movement to another. The distinctive mark of individual actions is that they are not necessitated but free. This freedom is under control and restricted in every respect. We have to look outside the individual for the purpose of its actions and for the spur which drives it to perform them, but the activity itself is in its very nature free, and we must say therefore of the life which is seeking and finding expression in bee activity that it is using freedom as a means to accomplish its ends. Observe moreover that the instinctive mode of the activity by no means affects the essential freedom of the actions. They are never forced as a nail is driven into wood when struck by the hammer. Instinct restricts the range of choice, limits even to a mathematical point in some cases the field of selection, but never interferes with the freedom of the response to an immediate incentive to act.

Let us now look closer at this mode of action which we call instinctive. In the bee it consists in a psychical disposition, which the individual has inherited, to restrict its activity

within a definitely appointed range and in a prefixed form. It exists as a spur or appetite driving the individual to exert this activity. It is directed to a definite end or purpose lying beyond the enjoyment of the individual and of which the individual cannot itself be conscious. In the hive bee this instinctive mode is so perfectly developed that the individuals all act as though they were not individually organized but constituent organs of a dominant individual. Instinct in the bee appears therefore to crush out, practically to extinguish, the freedom of the individual. What it actually does however is to leave freedom unimpaired but to direct the activity which is freely exercised into channels which are rigidly confined. It restricts the choice, limits the alternatives, in order to secure a rapid, prompt and automatic response to the stimulus. We have an exact analogy in the discipline of an army. The more the alternatives are eliminated and the more rigidly marked out the duties imposed, the more effective an instrument the army; yet every act of the army is the act of the individual soldiers in the army, and the activity of the soldier consists in his freedom. Were that extinguished the army would not function. By this we may see that individual freedom is not negative freedom, the absence of constraint, but positive freedom, which implies consciousness and self-determination. The ground of individual action, in other words, is in the nature of the individual; it is not chance, or chaos, or insub-

ordination. The contrast between the living world and the inert world is not between what is and what is not subject to the mechanical laws of nature, it is the contrast between what is determined entirely externally and what is determined by its own individual nature.

This principle of individuality with its implications of positive freedom rules everywhere throughout the living world. The difference is only in the mode of exercise of the activity and in the scope or range left open for deliberation. This means that life itself, the enduring universal impetus, thrust, spur, the activity we represent as a will, works everywhere through the principle of individuality and by this principle exclusively. The principle extends to the constituent parts of structural organizations and even to the germs which secure the continuity of generations. This principle of individuality is the principle of positive freedom or self-determination in complete contrast to the principle of necessity or external determination which characterizes the non-living world.

It is clear therefore that we can only understand the principle of individuality if we recognize that wherever there is individual action spontaneity is the original fact and necessity is derived from it by self-determination, or at least by internal and not by external determination. This is the first part of my argument. The second part is that wherever there is freedom there is consciousness. By this I do not mean that wherever we meet with freedom we

also meet with consciousness; this may or may not be true according to the interpretation we give to the term consciousness. I mean that freedom in an individual implies consciousness in its nature, in such a way that the measure of freedom of an individual is the measure of its consciousness, and vice versa. In any living creature the extent to which choice is open to it in its actions is the measure of its consciousness.

For proof of this we have only to compare together the instinctive mode of behavior such as we meet with it in the creature we have been considering, the honey-bee, and the intelligent mode of behavior or the intellect as we call it in ourselves.

Consider first what the insect has in common with man. We may set aside the difference of magnitude, which is negligible because it is purely relative (only to the man is the bee small and only to the bee is the man large). Individuality admits no external measurement. Generally while the type of structural organization is completely different, the psychical function of the two organisms is exactly similar. The bee apparently has the same sets of sense organs as the man, performing an exactly similar service though adapted to the special requirements of the individual's life cycle. The bee has two eyes for example, as we have, and their function like ours appears to be single vision. The eyes are differently constructed, compound with many facets, but there is good experimental evidence that bee vision is practi-

cally identical with that which we enjoy, with the difference of course of range and selection. The bee like us is organized to be sensitive to pain, though we may sincerely hope that its little body is not as liberally supplied as ours is with pain spots, and that the poet's words are not true when he says:

> And the poor beetle that we tread upon,
> In corporal sufferance finds a pang as great
> As when a giant dies.

In fact we can cite a sufficient number of analogies between the different types of structure in man and in the insect, and between the different types of function in each, to draw the conclusion that the living conscious activity in each is identical and that what is different is the mode of activity, and that this difference of mode in the activity can be interpreted on the principle that different interests determine perceptive selection and the formation of action. In what then does this modal distinction consist? What precisely is the difference between the invitation to act and the response to that invitation which we distinguish as instinctive, and the invitation and response which we term intellectual or intelligent? The characteristic difference is in the individual freedom, and the difference is quantitative. In instinctive responses there is no room for the play of freedom or the exercise of consciousness in choice; in intelligent responses freedom and consciousness play a positive part. Between the stimu-

lus to act and the formation and determination of the action there intervenes deliberation, there is opportunity for the consideration of alternatives, and finally there is the act of choosing which decides the definite form of the action. The comparison shows clearly that wherever consciousness is to play an active part in determining the action and shaping the event there must be freedom in the individual, and conversely wherever there is positive freedom there is actual consciousness. Conscious activity is free activity. When then we compare the actions of bees with the actions of men we see that in each case consciousness and freedom are essential factors, but the qualitative difference between the two kinds of actions which gives to each a distinct pattern, namely, the faithfulness to type and the invariability of the instinctive, the more or less vague formlessness of the intellectual, is due to a quantitative difference in the range allowed to the play of individual freedom and consciousness.

With this as our guiding clue let us consider the whole living world. We find that wherever we come upon living activity and in whatever form it exists its inmost character implies freedom and consciousness. Life and materiality seem to present an absolute contrast, so that we may say the principle of the one is freedom and of the other necessity. To see the full meaning of this, consider the difference between those forms of living activity which are sessile and

those forms which are mobile. Broadly speaking, plants are sessile and animals are mobile, but there are cases where plant life has to be mobile and where animal life has to be sessile. It is obvious that in the case of all moving creatures purely mechanical dispersion would serve no purpose and would defeat itself, movement to perform its vital end must be self-directed and self-controlled. The free mobility of a living creature unguided by consciousness would be meaningless, and wherever there is mobility we find that the degree of consciousness which the moving creature has at its disposal is proportionate to the nature of the task its free movement has to accomplish. Where on the contrary we find cases of creatures which have adapted themselves to sessile conditions we find consciousness in abeyance, suppressed or nullified. The living world everywhere illustrates this principle. What is perhaps the most significant illustration is afforded by those species in which sessile and mobile stages succeed one another in their life history. Thus the caterpillar stage of the butterfly is a stage in which movement is necessary for obtaining nutriment and, consequently the creature at this stage appears endowed with a high degree of consciousness; the succeeding pupa stage is marked by a far higher and more complicated internal activity, but movement would be detrimental and consciousness is dormant; in the next stage, the imago, in which the main task is sexual reproduction, consciousness and free-

dom are present in a very high degree. Also there is the very significant fact that wherever the constituent cells of an organism have individual work to perform which requires active movement and selection, then it is as though freedom and consciousness sprang into existence for them, while consciousness may be completely dormant in the greater organism of which they are only a part. For example the fertilizing spermatozoa are free, moving, very active and apparently within the range of their activity conscious, in contrast to the passive ova which they fertilize. In fact, throughout the living world it is as though freedom and conscious direction of free activity were at hand ready to spring up and function whenever occation called for it, as though life itself were a restraining force limiting and determining the outlet of an inexhaustible store of freedom which is always at its disposal.

If this argument is well founded its direct effect is to transform and indeed to invert the problem of freewill. That problem hitherto has always presented itself in the theoretical form of the difficulty of conceiving a locus for spontaneity in a world of universal determinism, and practically in the difficulty of understanding what positive rôle freedom could play if it be, as it has seemed it must be, a liberty of indifference. In all the historical forms of the freewill problem which we have passed in review necessity has stood out as the fundamental fact, and the difficulty has been to sup-

pose that freedom can be more than illusive appearance, a deception resulting from ignorance. Now we may see that basing ourselves on the concept of life and evolution freedom is the fundamental fact, and our problem is to discover how from it and by it necessity and determinism are generated. By what miraculous devices and contrivances does the free, conscious activity which exists in its own right, which is original and not derived, bring about the efficiency of its ends in material individualization? Everywhere throughout the living world efficiency is achieved by restricting the freedom it uses, controlling the will, depriving the freewill of choice by annulling the consciousness which accompanies choice. Even in the human world where freedom is greatest it is the man who believes, not the man who doubts, who succeeds in all the practical spheres of human activity.

This brings me to the most significant fact of all—the fact of human freedom. If we accept the theory of evolution, and if we see in the present forms of specific individualized life a universal will which has gained an outlet and found expression in organization, then there is one exception, or at least an apparent exception, to the rule that the creativeness of evolution is manifested in contrivances which secure efficiency by restricting freedom. In the intellectual mode of activity which has found its most adequate expression in the human form,

life has made positive use of freedom, has achieved its end by widening instead of narrowing the opening for the exercise of freewill. Anatomically and physiologically the specific differences which divide man from other forms of living creatures are very slight, and not always marks of superiority. So far as the general type of organization goes, man is only a little higher than the apes, and we look in vain for anything in the structure or function of his bodily form which clearly accounts for his domination in the living world. This domination is not due to animal strength or to cunning devices. It is due entirely to discourse of reason, and discourse of reason implies positive freedom. I do not mean that the difference between the human brain and the animal brain is of no account, nor do I deny that the rational nature of man is dependent on brain structure and generally on neural disposition, that, in a word, we can read in the brain of man the exact measure in which he exceeds the other kindred forms, including the discursive reason. What I am calling attention to is the nature of reason itself and of the intellectual mode of ideal apprehension and formative action on which it depends. This intellect we may truly describe as a function of freedom. What distinguishes man from the lower animals is not the efficient organization of his body but the degree of freedom which the intellectual mode of activity puts at man's disposal.

Let us look then first of all at what specially characterizes the intellectual or intelligent mode of activity as compared with the instinctive and vegetative modes. In order to form an adequate picture we have to imagine life as a universal impulsive will, working in individual centers with various specific organization, confronting a changing environment with a forward-looking attitude of rapt attention to the changing present, ready to respond to every new situation with appropriate action. There are three distinctive modes of individual response and these three modes can be seen to differ precisely in the degree of freedom at the disposal of the individual agent. In the vegetative mode there is no choice; consciousness and freewill are annulled. There is freedom, for there is responsive action, and all living action implies this essential freedom. Thus the flower bud opens in response to the sunlight, while the clay hardens and cracks under the influence of the solar heat. One is a vital action, the other a mechanical movement. But there is no individual freewill in the flower bud giving it power to choose whether it will open or not. In the instinctive mode there is individual freedom and choice, but the efficiency of the action and its perfection are dependent on the freedom being restricted and controlled. An instinctive action differs from a pure reflex just in the measure in which consciousness and freedom are at the agent's disposal. The intellectual mode of activity is that in which the

individual acts with the whole situation apprehended and deals with that situation as a whole. An intelligent action is one which is formed by reflection and deliberation. The end is presented to the individual in idea before it is actualized. The whole scheme of intellectual response is to provide a means of self-determination and self-expression by the exercise of freewill.

This intelligent mode of action is not the exclusive possession of the human species, it is implicit in the principle of individuality itself; but nowhere in the order of animal existence is it so predominantly and characteristically the type of activity. When we contemplate our own human world and the range of actions it opens to us, the reflex and instinctive responses of our organism to its environment drop out of sight. We are unconscious of them and therefore they seem absent or of no account. All seems subordinate to the life of reason. Reason is our great prerogative. What does it signify? Reason is the power that comes from our positive exercise of freewill. It is secured to us by our structure. The form in which we exercise reason depends on the upright position setting free the forelimbs for organs of manipulation, on the convergent vision providing us with distance receptors of the most delicate adjustability, on the integration of the sense organs of sound with the muscles of articulation, endowing us with the power of speech and enabling us to communicate and interchange ideas with one

another. All these capabilities are registered in the brain, for they function by means of the dispositions of the neural controls in the cerebral substance. And all these endowments are the instrumental means the end of which is the positive exercise by the individual of freewill and the power of actual new creation which freewill has brought with it.

Wonderful are the words of the Psalmist:

When I consider thy heavens, the work of thy fingers,
The moon and the stars which thou hast ordained;
What is man that thou art mindful of him?
And the son of man that thou visitest him?
For thou hast made him a little lower than the angels,
And hast crowned him with glory and honor.
Thou madest him to have dominion over the works of thy hands;
Thou hast put all things under his feet:
All sheep and oxen,
Yea, and the beasts of the field;
The fowl of the air and the fish of the sea,
Whatsoever passeth through the paths of the seas.

Consider this strange dominion of man. If the angels represent the grade of existence above us we cannot know in what way they excel, for their existence is hidden from us, doubtless by a natural mechanism. When however we compare our humanity with all the other forms of animality, some of which lie only a very little below us in the evolutionary scale, we cannot but be struck with the one thing which consti-

tutes the uniqueness of man. Man alone has superposed an artificial life on his natural life and thereby has found means to pass from a material existence, for which alone evolution appears to have provided, into a realm of spiritual values, into a world of beauty, truth and goodness, a world in which whatever be the eternal values he has at least found means to hold communion with those who have lived and with those who will live. What has brought him this enfranchisement? What has broken the bonds which bind him to the present moment of activity? The creative evolution which has developed in man the delicate organization of the human structure, the efficiency of the brain, the perfection of organic functioning, has not also created, nor even it would seem had in view, the spiritual realm of values which has given man civilization, science, religion, art, philosophy. All that evolution has done has been to set him free and trust him with freedom and thus place in man's hands his own fate, the future of humanity. Man has recognized his freedom and made use of it. This is the unique phenomenon. So far as we can read the wonderful record of the rocks and pass in review the great eons of world history, there is nothing like it, nothing even indicating it until the actual coming of man. When man arrives a new spiritual evolution supervenes on the old natural evolution. It has brought responsibility. Man may abuse his freedom. He may be going to turn it to self-destruction. The

whole human spiritual achievement may be destined to pass and natural evolution will then continue on its way. Humanity may be superseded by some super-nature yet to be created. Such is the modern aspect of the old freewill problem.

I began by showing how the idea of freedom in its modern form was introduced into the world by Christianity, in the new conception of man and the philosophical interpretation of history which we owe to the genius of the apostle Paul. I will close with a quotation from a modern philosopher who, though he has been dead for nearly a hundred years, more than anyone represents the spirit which is animating science and philosophy today. Hegel, in his *Philosophy of Mind,* writes: "It was through Christianity that the idea that the human being is actually free came into the world. According to Christianity, the individual *as such* has an infinite value as the object and aim of divine love, destined as mind to live in absolute relationship with God himself, and have God's mind dwelling in him: i.e. man is implicitly destined to supreme freedom. If, in religion as such, man is aware of this relationship to the absolute mind as his true being, he has also, even when he steps into the sphere of secular existence, the divine mind present with him, as the substance of the state, of the family, etc. These institutions are due to the guidance of that spirit and are consti-

tuted after its measure; whilst by their existence the moral temper comes to be indwelling in the individual, so that in this sphere of particular existence, of present sensation and volition, he is *actually* free."

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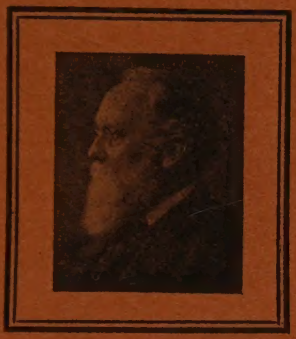

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